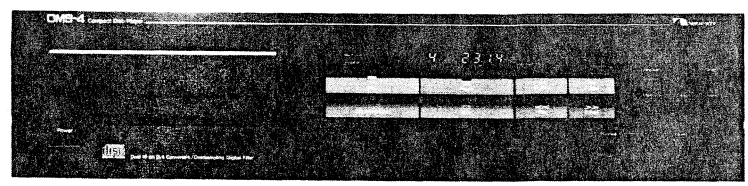
Nakamichi

Service Manual

Nakamichi
OMS-4
OMS-4A
OMS-4E
OMS-40

Compact Disc Player



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1. GENERAL

1.1 PACKING MATERIALS and OWNER'S MANUAL

The OMS-4/4A/4E/40 is equipped with the Remote Control Unit RM-4-CD.
The Remote Control Unit RM-4CD will be supplied per unit as for space parts.

Part No.	Description	Q'ty
0C81615A	Carton Box OMS-4	1
0C81612A	Carton Box OMS-4A	1
0C81616A	Carton Box OMS-4E	1
0C81617A	Carton Box OMS-40	1
0D04640B	Owner's Manual (English)	1
0D04642A	Owner's Manual (Japanese)	1
0D04641A	Owner's Manual (English/German/French)	1
CA80519A	Remote Control Unit	1

1.2 WARNING

1.2.1 IN SERVICE MANUAL

This unit uses an invisible semiconductor laser to pick up the digital signal on the disc. Since the laser can takes the signal without contact, there's no anxiety of rubbing down the disc and the Pickup Ass'y.
But you must treat the laser with the greatest of care. In servicing, please pay attention to the following.

1) Avoid direct exposure to beam.
   Laser can be radiated when the interlocks fail or are defeated.
2) Do not break up the Laser Pickup Ass'y.
3) Refered to in itme 2.7 Laser Pickup Ass'y on page 5.

1.2.2 LASER SPECIFICATION

The laser provided in the unit is GaAlAs semiconductor laser. The theory of the laser emitting is the same as the light emitting of LEDs. The difference is that the laser has only one wavelength and is coherent.
One of the characteristics of laser diodes is that the threshold level can be changed accordance with the surrounding temperature. To correct this characteristc, the laser diode used in this unit provides a monitor photo diode and controls the output power level of the laser to be constant.
The Laser Pickup Ass'y consists of a laser diode, 6-split photodiode, object lens, beam splitter and coils. The object lens moves forward or back by the focus servo coil and also moves left or right by the tracking servo coil. The laser passes through the prisms and the lenses and is emitted through the object lens. The power of it is decreased to 0.3mW passing through these optical instruments. The laser reflected by the disc passes through the optical instruments again and detected by the 6-split photo diode.

1.2.3 CAUTION

Before returning the unit to the customer, make sure you make either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamp, or if the resistance from the chassis to either side of the power cord is less than 240k ohms, the unit is defective.
WARNING – DO NOT return the unit to the customer until the problem is located and corrected.

1.2.4 Main P.C.B

The Main P.C.B. Ass'y C230, C231, C501 – C509, C510, C520, C351, C353, C215, are attached with Sony Bond SC12N.
After replacing any of these components, be certain to apply them with Sony Bond SC12N.

2. REMOVAL PROCEDURES

2.1. Top Cover Ass'y and Bottom Cover Ass'y

(1) Refer to Fig. 2.1.
(2) Remove F01 and F02, then lift and remove F03 (Top Cover Ass'y).
(3) Remove F04, F05, F06 and F07, then lift and remove F08 (Bottom Cover Ass'y).

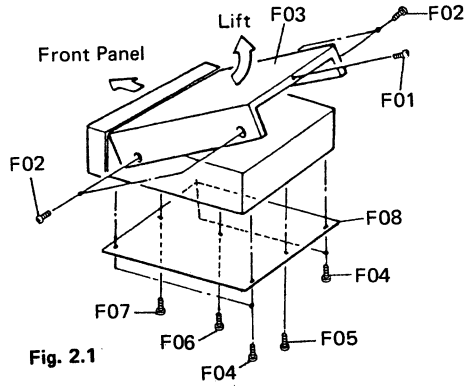


Fig. 2.1

2.2. Servo P.C.B. Ass'y

(1) Refer to Fig. 2.2 and Fig. 2.3.
(2) Remove the Top Cover Ass'y and the Bottom Cover Ass'y refered to in item 2.1.
(3) Remove F01 and F02 (P.C.B. Support) and five connectors (CN-101, CN-102, CN-103, CN-202 and CN-203), then F03 (Servo P.C.B. Ass'y).

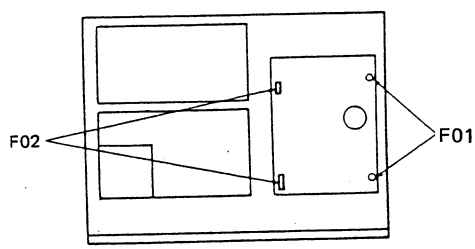


Fig. 2.2

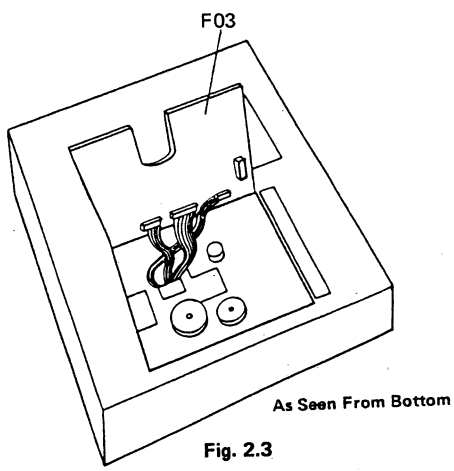


Fig. 2.3

2.3. Front Panel Ass'y

(1) Refer to Fig. 2.4 and Fig. 2.5.
(2) Remove the Top Cover Ass'y and the Bottom Cover Ass'y refered to in item 2.1.
(3) Eject the Disc Tray Ass'y and remove F01 (Disc Drawer Cover) by pressing it down with your fingers.
(4) Remove F02 and F03, then release the latches located on both sides of the Chassis.
(5) Remove two connectors (CN-401 and CN-402), then F04 (Front Panel Ass'y).

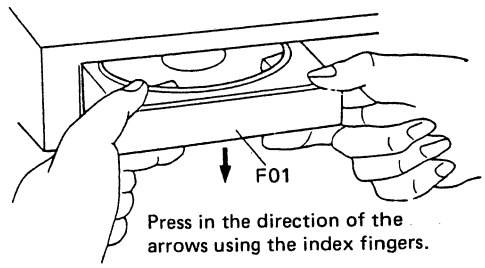


Fig. 2.4

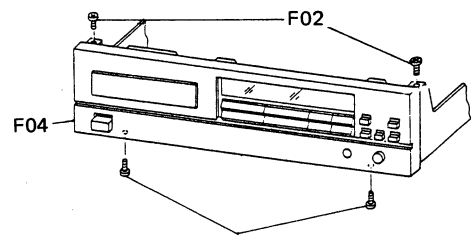


Fig. 2.5

2.4. Control & Display P.C.B. Ass'y

(1) Refer to Fig. 2.6.
(2) Remove the Front Panel Ass'y refered to in item 2.3.
(3) Remove F01, then release the latches located on the Front Panel Ass'y, then F02 (Control & Display P.C.B. Ass'y).

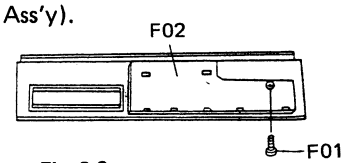


Fig. 2.6

2.5. Main P.C.B. Ass'y and Disc Mechanism Ass'y

(1) Refer to Fig. 2.7.
(2) Remove the Front Panel Ass'y refered to in item 2.3.
(3) Remove F01, F02, F03, F04 (P.C.B. Holder), F05, F06 and F07, then F08 (Main P.C.B. Ass'y).
(4) Remove F09, then F10 (Disc Mechanism Ass'y).

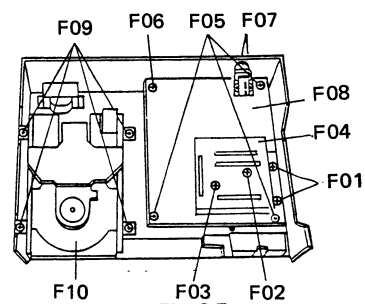


Fig. 2.7

2.6. Chuck Arm Ass'y and Disc Tray Ass'y

(1) Refer to Fig. 2.8.
(2) Remove the Front Panel Ass'y refered to in item 2.3.
(3) Remove F01, then F02 (Chuck Arm Plate), F03 (Chuck Arm Spring), F04 and F05 then F06 (Chuck Arm Ass'y).
(4) Remove F07 and F08, then F09 (Disc Drawer Guide L), F10 (Disc Drawer Guide R), thenF11 (Disc Tray Ass'Y).

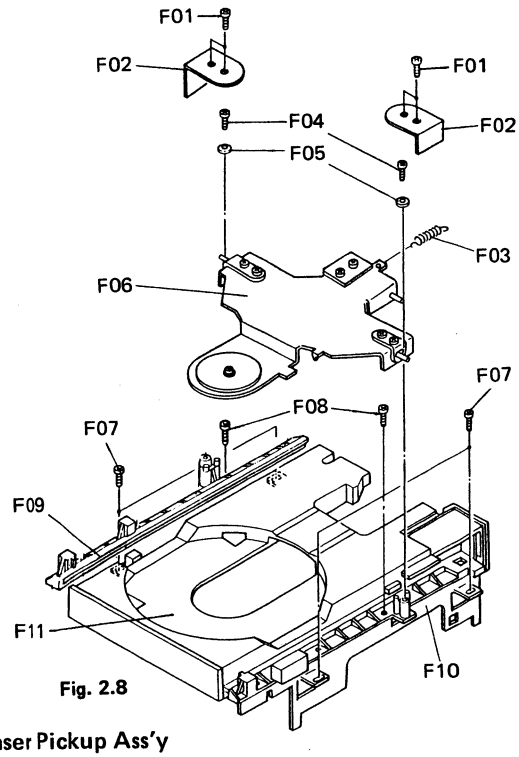


Fig. 2.8

2.7. Laser Pickup Ass'y

(1) Refer to Fig. 2.9.
(2) Remove the Disc Tray Ass'y refered to in item 2.6.
(3) Remove the three connectors (CN-101, CN-102 and CN-103) from the Servo P.C.B. Ass'y.
(4) Remove F01, then F02 (Laser Pickup Ass'y) along with F03 (Pickup Guide Rail).

NOTE: IF IT IS NOT CERTAIN THAT THE LASER PICK-UP ASS'Y IS DEFECTIVE, DO NOT REMOVE THE THREE CONNECTORS (CN-101, CN-102 and CN-103). IF YOU REMOVE THESE THREE CONNECTORS, THE LASER DIODE OF THE LASER PICKUP ASS'Y WILL BE DAMAGED.

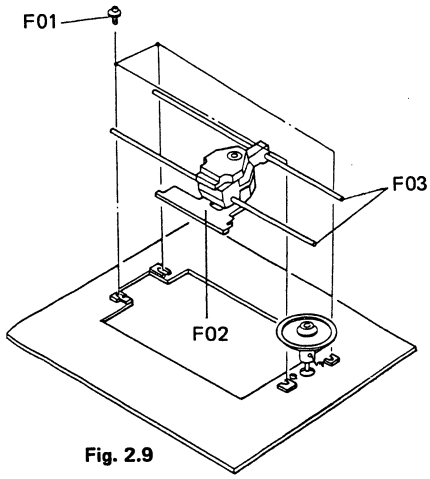


Fig. 2.9

Installing a new Laser Pickup Ass'y

(1) When installing a new Laser Pickup Ass'y you must connect its three connectors (CN-101, CN-102 and CN-103) to the Servo P.C.B. Ass'y first.
(2) Then using a grounded tip soldering iron only, remove the short-circuiting solder in the area of the dotted circle as shown in Fig. 2.10; this small P.C.B. which is incorporated with the Laser Pickup Ass'y.

CAUTON: IF THE SHORT-CIRCUITING SOLDER IS REMOVED BEFORE THE THREE CONNECTORS (CN-101, CN-102 and CN-103) ARE CONNECTED, DAMAGE TO THE LASER DIODE OF THE LASER PICKUP ASS'Y COULD OCCUR IN A MATTER OF SECONDS, CAUSING FAILURE OF THE NEW LASER PICKUP ASS'Y.

NOTE: THE LASER PICKUP ASS'Y STOCKED AS SPARE PART, MUST BE SHORTED TO DOTTED CIRCLE OF THE SMALL P.C.B. WHICH IS INCORPORATED WITH THE LASER PICKUP ASS'Y AS SHOWN IN Fig. 2.10.

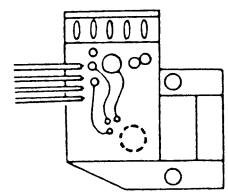


Fig. 2.10

2.8. Disc Motor

(1) Refer to Fig. 2.11.
(2) Remove Disc Tray Ass'y refered to in item 2.6.
(3) Remove F01, then pull up F02 (Turntable B Ass'y)
(4) Remove F03, then F04 (Disc Motor).

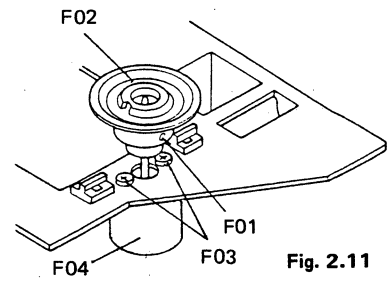


Fig. 2.11

RE-ASSEMBLY OF THE DISC MOTOR:

(1) Refer to Fig. 2.12.
(2) When re-assembling the Disc Motor, adjust the height of the turntable using the Turntable Adjustment Gauge (0C82258A).

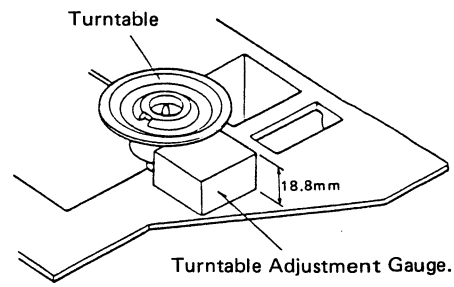
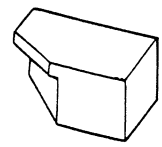


Fig. 2.12

3. ADJUSTMENT PROCEDURES

3.1 Meters and Gauge

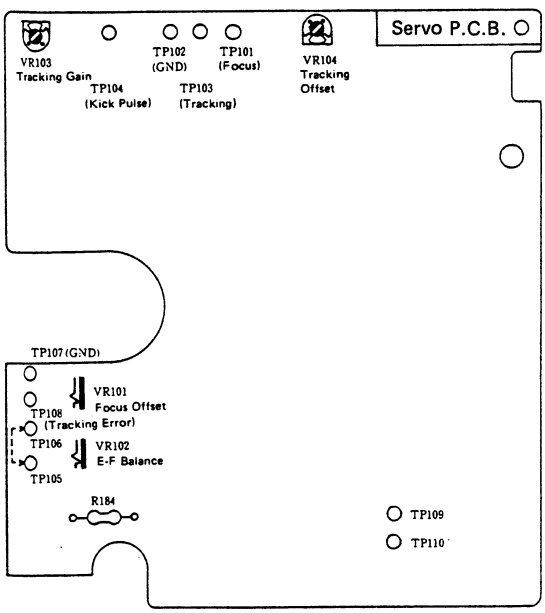
(1) Oscilloscope (15 MHz or more)
(2) AC Voltmeter
(3) DC Voltmeter
(4) Optical Power Meter
(5) Phillips Test Sample Disc 5/5A
(6) Sony Test C.D. Type III (YEDS-7)
(7) Frequency counter
(8) Distortion Meter
(9) Turntable Adjustment Gauge (Fig. 3.1)

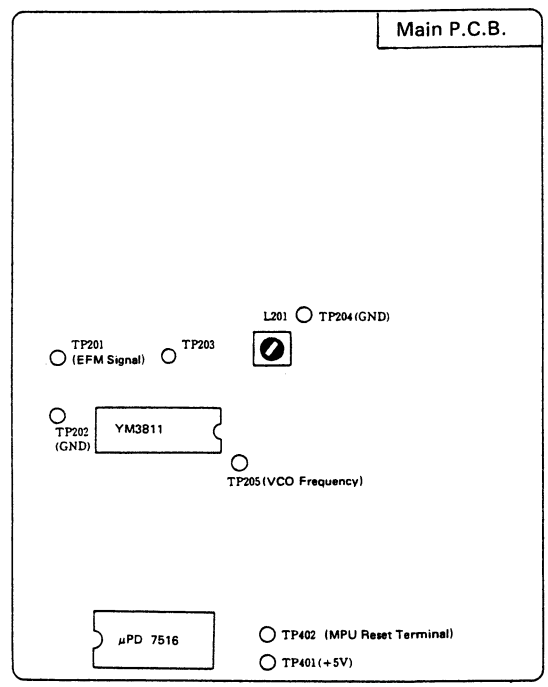


Turntable Adjustment Gauge (0C82258A)

Fig. 3.1

3.2 Parts Location for Adjustment





NOTE: The above Semi-fixed VR positions are for initial presetting.

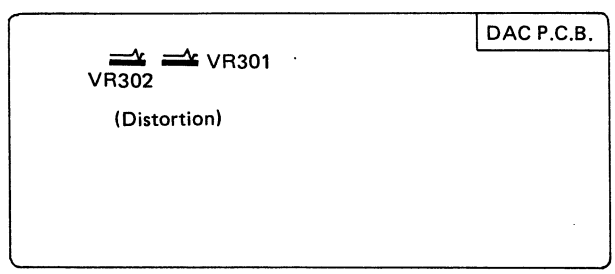


Fig. 3.2

3.3 Laser Pickup Laser Power Check

(1) Remove the Top Cover Ass'y refered to in item 2.1 on page 4.

(2) Short-circuit TP105 and TP106 located on the Servo P.C.B. Ass'y.

(3) Place the optical power meter against the pickup (Fig. 3.3), and check that the laser power is between 0.15mW and 0.4mW.

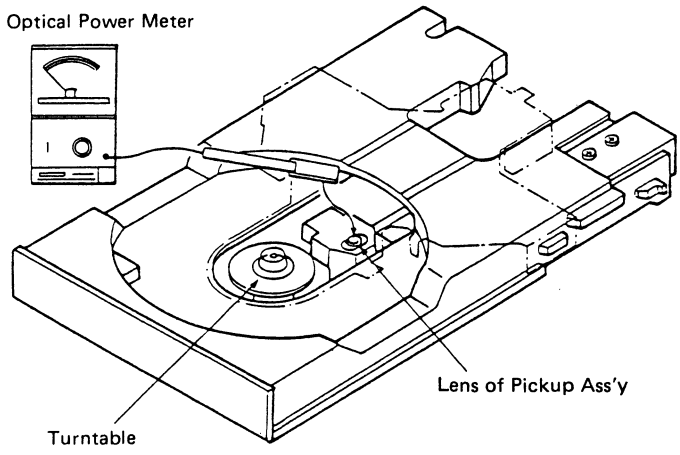


Fig. 3.3

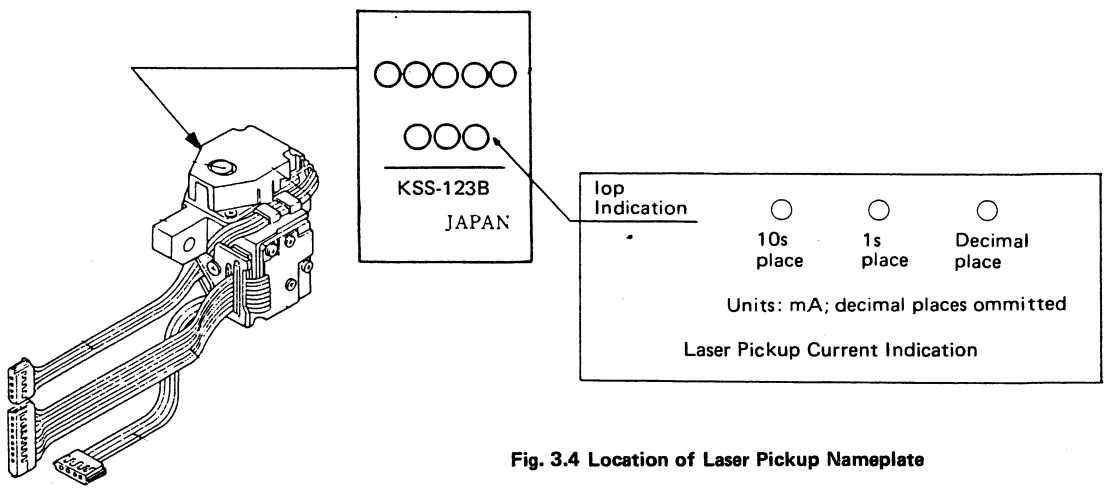


Fig. 3.4 Location of Laser Pickup Nameplate

3.4 Adjustment of VCO on Main P.C.B. Ass'y

3.4.1 VCO Frequency Adjustment (OMS-4 is No signal.)

(1) Connect the frequency counter to TP205 (VCO Frequency) and TP204 (GND).

(2) Remove CN-203 connector cord, turn the power switch on, and short-circuit TP201 and TP202.

(3) Rotate the L201 core and adjust so that the frequency counter shows a value of 4.322MHz.

(4) After adjusting, turn the power off and connect the CN-203 connector cord.

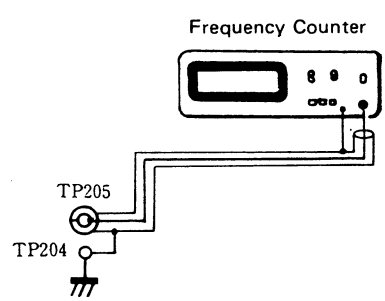


Fig. 3.5

3.5 Adjustment of Servo P.C.B. Ass'y

3-5-1 Setting of initial position of the semi-fixed volume

Before adjusting, preset all semi-fixed volumes are their mechanicall center (VR101, 102, 103, 104).

3.5.2 Tracking Offset Adjustment

(1) Rotate VR103 fully clockwise.

(2) Short circuit TP105 and TP106, and without inserting a disc adjust VR104 so that the voltage of TP103 (Tracking Coil Output) and TP102 (GND) is 0 ± 5mV.

(3) Disconnect TP105 and TP106, then preset VR103 to mechanical center.

3.5.3 Focus Offset Adjustment

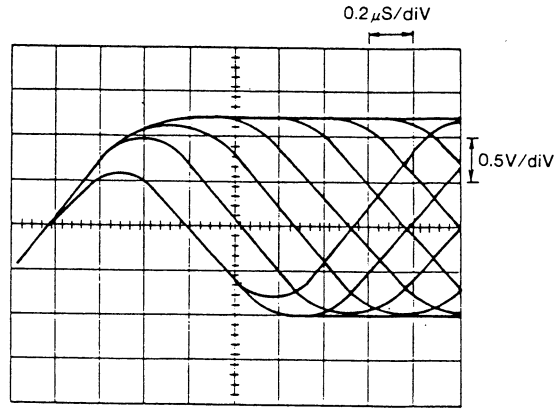
(1) Connect a DC voltmeter across R184 (120Ω) on Servo P.C.B. Ass'y.

(2) Short circuit TP105 and TP106 (Laser Power On) on Servo P.C.B. Ass'y.

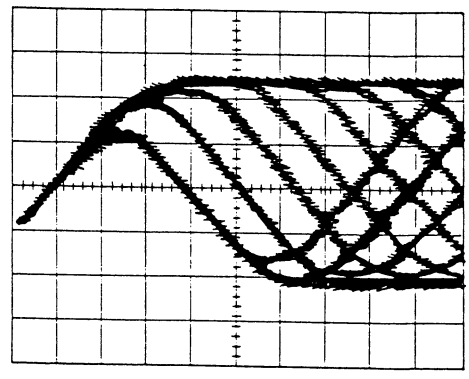
(3) Turn the power switch on, and calculate the current from voltage on both ends of R184, and check that the difference compareted to the laser pickup indication (Fig. 3.6) is within ±10% for the negative side. Next turn the power switch off and disconnect the AC voltmeter.

(4) Turn the power back on, set the Philips Test Sample 5 test disc, and observe the TP201 output waveform (EFM signal).

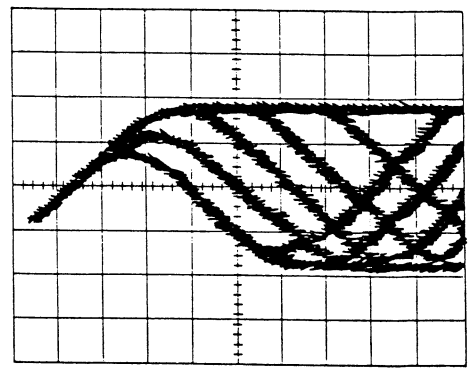
(5) Adjust the VR101 so that the EFM signal level becomes high and the waveform becomes distinct, so that the lines are not thick (Fig. 3.6).



Focus Offset VR (VR101) Adjustment



Focus Offset VR (VR101) at Maximum
(Level is high but waveform is unclear)



Focus Offset VR (VR101) at Minimum
(Level is low and wavefrom is unclear)

Fig. 3.6 Focus Offset VR EFM Signal Waveforms

3.5.4 E-F Balance Adjsutment (Supplementary Beam Balance Adjustment)

(1) Turn the power off and use a 10kΩ resistor to short TP105 and TP106.

(2) Connect the oscilloscope between TP201 (EFM signal) and TP202 (GND), and also between TP108 (Tracking Error) and TP107 (GND).

(3) Turn the power switch, load the Philips Test Sample 5 test disc and playback from the first selection.

(4) Connect TP402 (MPU Reset Terminal) and TP401 (+5V) on the Main P.C.B. Ass'y.
(As the microprocessor is in the Reset mode, the LED does not light)

(5) Rotate VR103 (Tracking) fully clockwise.

a) Oscilloscope Ranges
b) Voltage Range (AC): CH1 . . . . 1V
CH2 . . . . 2V
c) (Set trigger on CH2)
d) Sweep Range: 1mS

(6) Observe the trakcing error waveforms (Fig. 3.7) and adjust VR102 so that the GND line is positioned at exactly half the waveform P-P value.

(7) Turn the power switch off, disconnect the oscilloscope, TP401 (+5V) and TP402 (MPU Reset terminal), and set VR103 to the mechanical center.

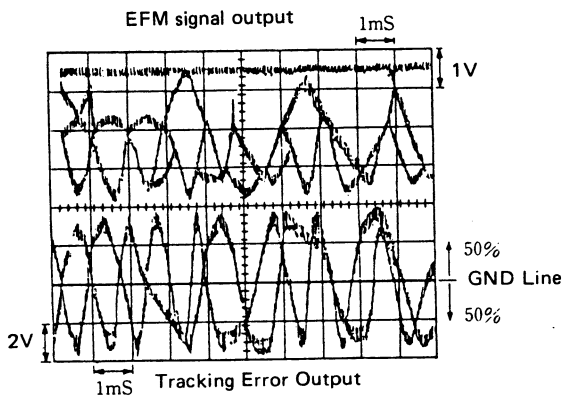


Fig. 3.7

3.6 DISTORTION ADJUSTMENT

(Adjust after the Servo P.C.B. adjustment has been completed) Play the 20th selection on the Sony Type III test disc (1kHz – 60dB). Connect the L.P.F. (20kHz) to the AC voltmeter and the distortion meter.
Adjust the VR301/302 so that distortion in the 3% range is as low as possible.

> Dynamic range is greater than 91 dB.

< Check to make sure that distortion is below 0.007%.

3.5.5 Tracking Gain Adjustment

(1) Load the Philips Test Sample 5 test disc (non-scratched), observe the noise voltage on the voltmeter, and adjust VR103 so that the noise voltage on TP103 (Tracking) and TP102 (GND) is 0.26V RMS ±0.01V (Fig. 3.8).

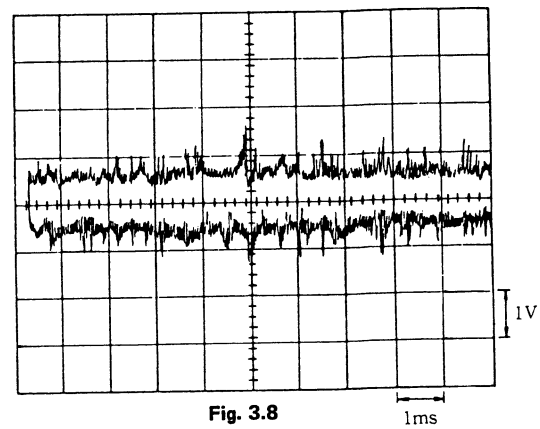


Fig. 3.8

3.5.6 Lens Kick Gain Check

(1) Connect TP201 (EFM signal) and TP202 (GND) to CH1 on the oscilloscope, and TP104 (lens kick pulse) and TP102 (GND) to CH2.

(2) Insert the Philips Test Sample 5 test disc and check the size of the TP201 (EFM signal) output waveform (Fig. 3.9).

(3) Pause at selection 10 on the Philips Test Sample 5 test disc.

Oscilloscope Range:
Voltage Range (AC): CH1 . . . 1V
CH2 . . . 2V
Sweep Range: 0.2ms

Set a trigger on the leading edge of the TP104 waveform on CH2 (Lens Kick) and observe the TP201 waveform (Fig. 3.10).

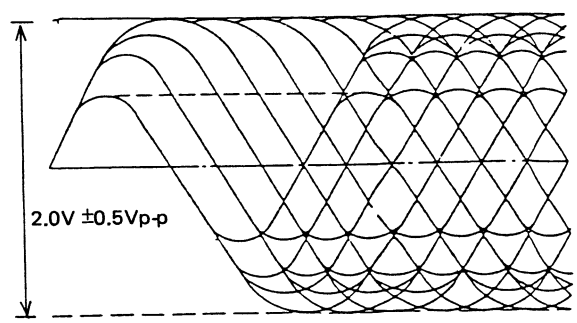
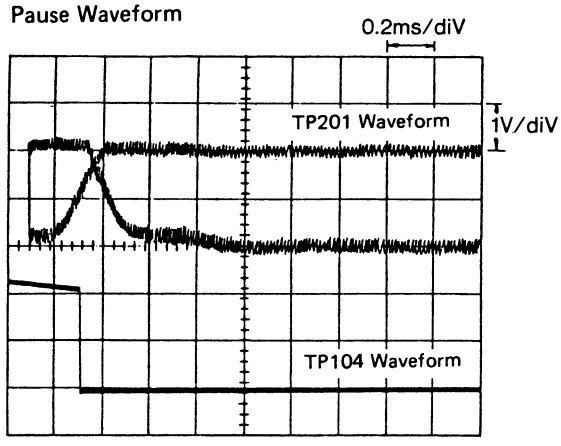
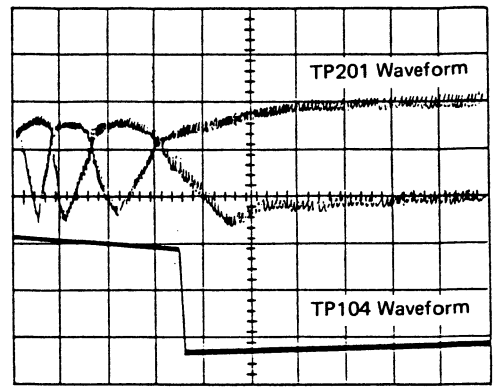


Fig. 3.9 EFM Signal

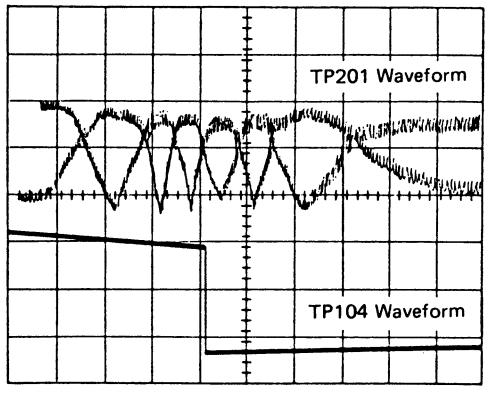
Pause Waveform



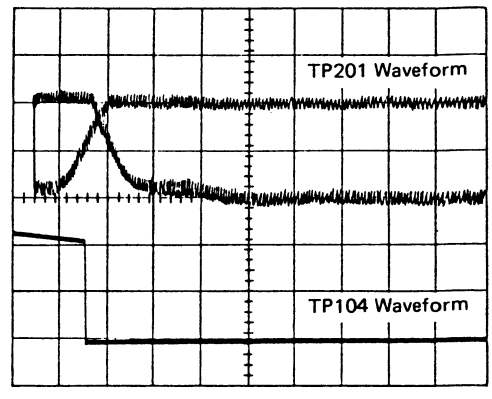
F.Skip Waveform



R.Skip Waveform



Rev. Waveform



F. Fwd Waveform

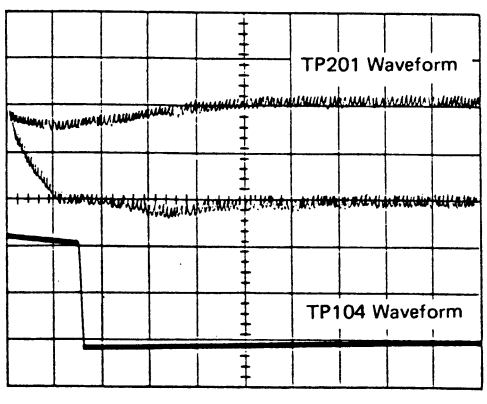


Fig. 3.10 EFM Signal Waveforms Upon Track Jump

3.7 Operation Check

3.7.1 Playability

Use the Philips Test 5A (scratched) test disc, play the following portions and make sure no tracks are jumped.

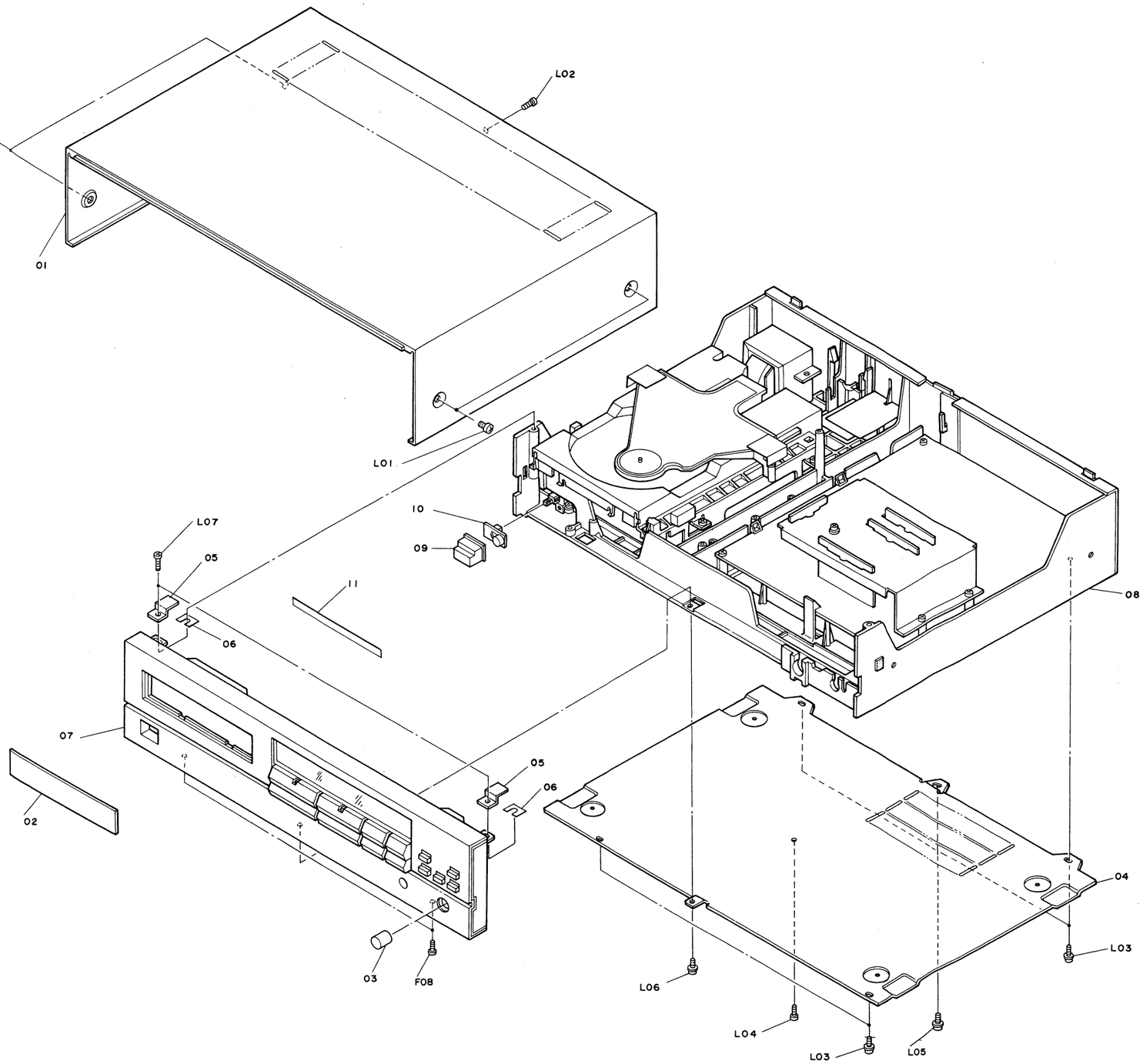
(1) Wedge (Interruption)
Selection 6 0'00" – 0'30"

(2) Black Spot (Black Dot)
Selection 12 1' 10" – Selection 13 0' 30"

(3) Fingerprint
Selection 19 0' 00" – 0' 30"

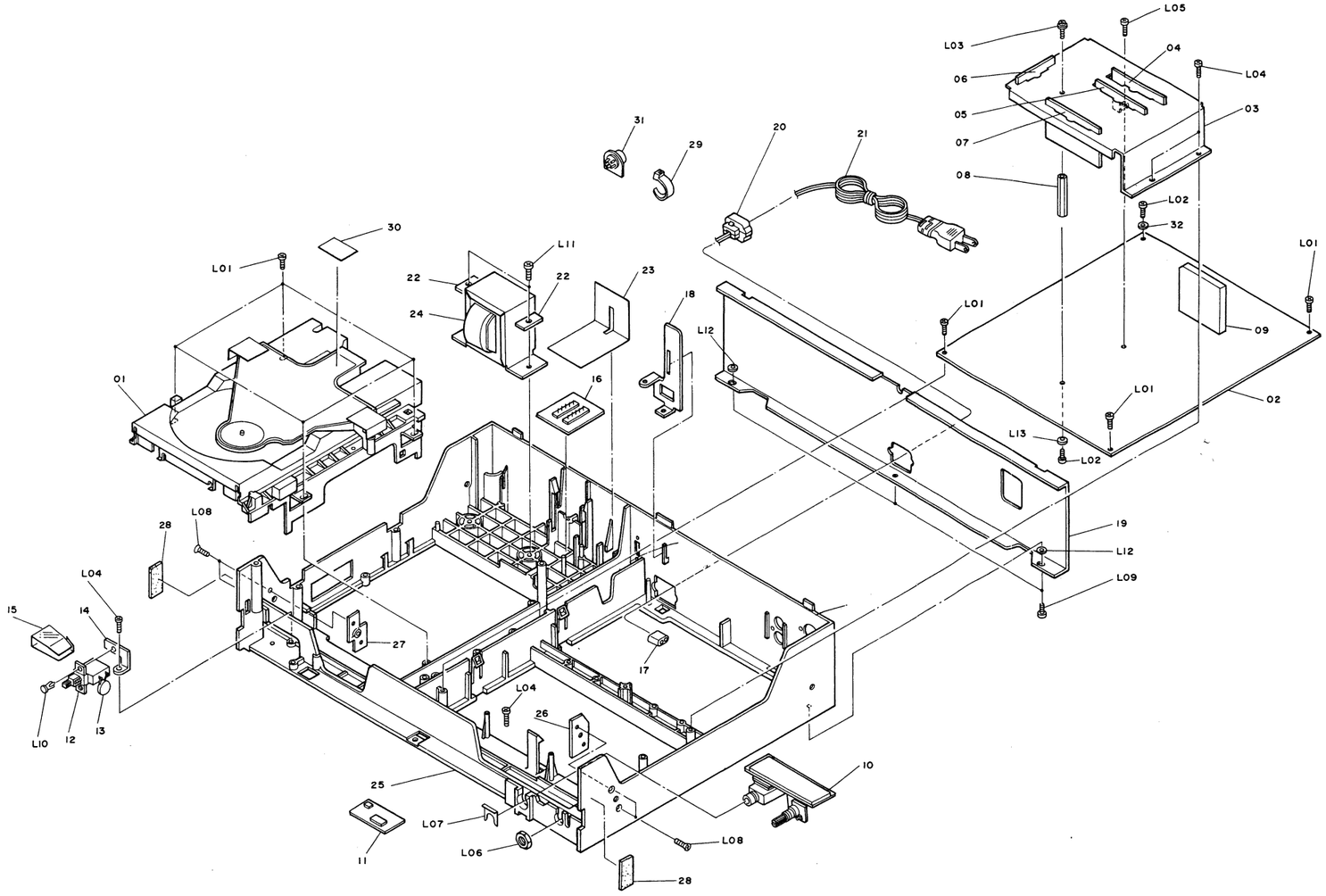
4. MECHANISM ASS'Y AND PARTS LIST

4.1. Synthesis



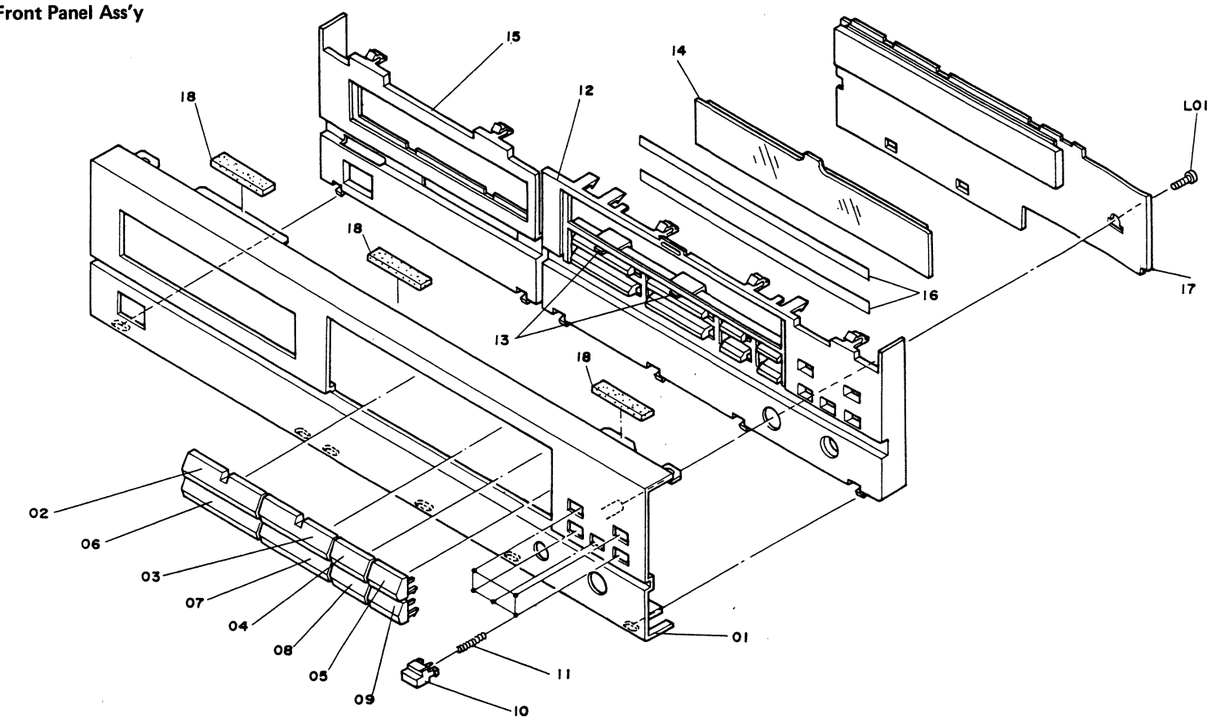
Schematic Ref. No.	Part No.	Description	Q'ty
		Synthesis	
01	CA80511A	Top Cover Ass'y	1
	(0C81483A)	Top Cover	(1)
	(0C81582A)	Vibration Isolating Sheet A	(1)
	(0C81598A)	Top Cover Cushion	(2)
	(0C81652A)	Cushion	(1)
	(0C82350A)	Vibration Isolating Sheet B	(2)
	(0C82352A)	Rubber Cushion	(1)
	(0M04377B)	Caution Label	(1)
02	0C81603A	Disc Tray Cover	1
03	CA80396A	Volume Knob Ass'y	1
04	CA80512A	Bottom Cover Ass'y	1
	(0C81561A)	Bottom Cover	(1)
	(0C81479A)	Leg	(4)
	(0M04377B)	Caution Label	(1)
	(0M04810A)	Shipping Screw Caution Label	(1)
05	0C82351A	Top Cover Support	2
06	0C81651A	Front Panel Spacer	2
07	CA80518A	Front Panel Ass'y (OMS-4)	1
	CA80430A	Front Panel Ass'y (OMS-4A)	1
	CA80510A	Front Panel Ass'y (OMS-4E)	1
	CA80509A	Front Panel Ass'y (OMS-40)	1
08	CA80524A	Chassis Ass'y (OMS-4A)	1
	CA80525A	Chassis Ass'y (OMS-4E)	1
	CA80526A	Chassis Ass'y (OMS-40)	1
	CA80527A	Chassis Ass'y (OMS-4(Canada))	1
	CA80528A	Chassis Ass'y (OMS-4(Australia))	1
	CA80529A	Chassis Ass'y (OMS-4(Others))	1
09	0C81515A	Power Switch Knob	1
10	0C81505A	Power Switch Joint	1
11	0C81594A	Adhesive Tape 3×30	1
—	0M04813A	UL Approval Label	1
—	0M05608A	Manufacturing Periodic Seal	1
—	0M04113A	LA Approval Label	1
—	—	CSA Approval Label	1
—	0M04434B	EP Approval Label	1
—	0M04814A	Pass Label	1
—	0M04815A	Serial Number Seal	1
L01	0C81642A	BT4×12⊕Flanged with washer (Black zinc)	4
L02	0C81623A	BT3×18⊕Pan Projected (Black)	1
L03	0E03368A	BT3×12⊕Binding with washer	4
L04	0E00888A	BT3×12⊕Binding	1
L05	0E03391A	BT3×8⊕Binding Projected	1
L06	0E03365A	BT3×8⊕Binding Projected (Black Chromate)	1
L07	0E03399A	BT3×12⊕Countersunk	2
L08	0E00921A	BT3×8⊕Binding (Black Chromate)	2

4.2. Chassis Ass'y

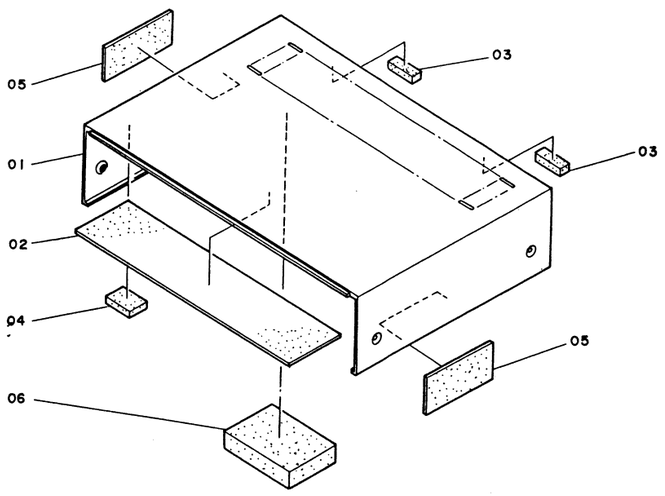


Schematic Ref. No.	Part No.	Description	Q'ty
	CA80524A	**Chassis Ass'y (OMS-4A)**	
	CA80525A	**Chassis Ass'y (OMS-4E)**	
	CA80526A	**Chassis Ass'y (OMS-40)**	
	CA80527A	**Chassis Ass'y (OMS-4(Canada))**	
	CA80528A	**Chassis Ass'y (OMS-4(Australia))**	
	CA80529A	**Chassis Ass'y (OMS-4(Others))**	
01	CA80436A	Disc Mechanism Ass'y	1
02	CA80409A	Main P. C. B. Ass'y	1
03	0C81570A	P. C. B. Holder	1
04	CA80413A	DAC P. C. B. Ass'y	1
05	CA80412A	DF/F P. C. B. Ass'y	1
06	CA80407A	RAM P. C. B. Ass'y	1
07	CA80406A	Signal Process P. C. B. Ass'y	1
08	0C81581A	Stud 60mm	1
09	CA80415A	Analog Filter P. C. B. Ass'y	1
10	CA80410A	Headphone Amp. P. C. B. Ass'y	1
11	CA80514A	Search P. C. B. Ass'y	1
12	0C81890A	Power Switch	1
13	0C82353A	CC 4700pf 400V (M)	1
14	0C81539A	Power Switch Holder	1
15	0C81600A	Power Switch Insulator (OMS-4E)	1
16	CA80416A	Terminal P. C. B. Ass'y	1
17	0C81880A	Ferrite Core	1
18	0C81560A	Bushing Holder	1
19	0C81572A	Rear Panel (OMS-4)	1
	0C81562A	Rear Panel (OMS-4A)	1
	0C81573A	Rear Panel (OMS-4E)	1
	0C81575A	Rear Panel (OMS-40)	1
	0C81574A	Rear Panel (OMS-4(Others))	1
20	0C81472A	Cord Bushing	1
21	0C82300A	Power Cord (OMS-4A & OMS-4 (Canada))	1
	0C82303A	Power Cord (OMS-4E)	1
	0C82301A	Power Cord (OMS-40)	1
	0C82356A	Power Cord (OMS-4(Australia))	1
	0C82302A	Power Cord (OMS-4(Others))	1
22	0C81655A	Transformer Reinforce Plate	2
23	0C81983A	Terminal P. C. B. Insulator (OMS-4A & OMS-4(Canada))	1
24	0C81879A	Power Transformer (OMS-4A & OMS-4(Canada))	1
	0C82298A	Power Transformer (OMS-4E)	1
	0C82297A	Power Transformer (OMS-40)	1
	0C82299A	Power Transformer (OMS-4(Others))	1
25	0C81482A	Chassis	1
26	0C81564A	Top Cover Holder R	1
27	0C81563A	Top Cover Holder L	1
28	0C82385A	Cushion	2
29	0C81471A	Insu-Lock L=94mm	5
30	0M04611A	US Laser Caution Label (OMS-4A)	1
31	0C82355A	Voltage Selector (OMS-4(Others))	1
32	0C81519A	Ground Plate	1
—	0C81922A	4P Connector Cord	1
—	CA80425A	Chassis Wire Ass'y	1
L01	0E03157A	BT3×8⊕Binding with Washer	7
L02	0E03391A	BT3×8⊕Binding Projected	2
L03	0E03415A	M3×8⊕Pan(3A)	1
L04	0E00868A	BT3×8⊕Binding	4
L05	0E00888A	BT3×12⊕Binding	1
L06	—	Volume Nut	1
L07	—	Snap Plate	1
L08	0C82416A	M3×8⊕Countersunk	4
L09	0E00921A	BT3×8⊕Binding (Black Chromate)	2
L10	0C81625A	Plastic Rivet	1
L11	0E00924A	BT4×16⊕Binding	2
L12	0C81630A	Washer 3mm Fiber	3
L13	0C81624A	Washer 3.2×8×0.5	1

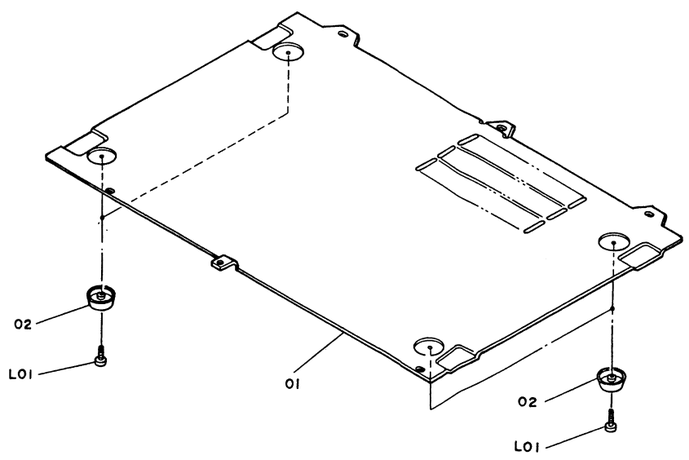
4.3. Front Panel Ass'y



4.4. Top Cover Ass'y

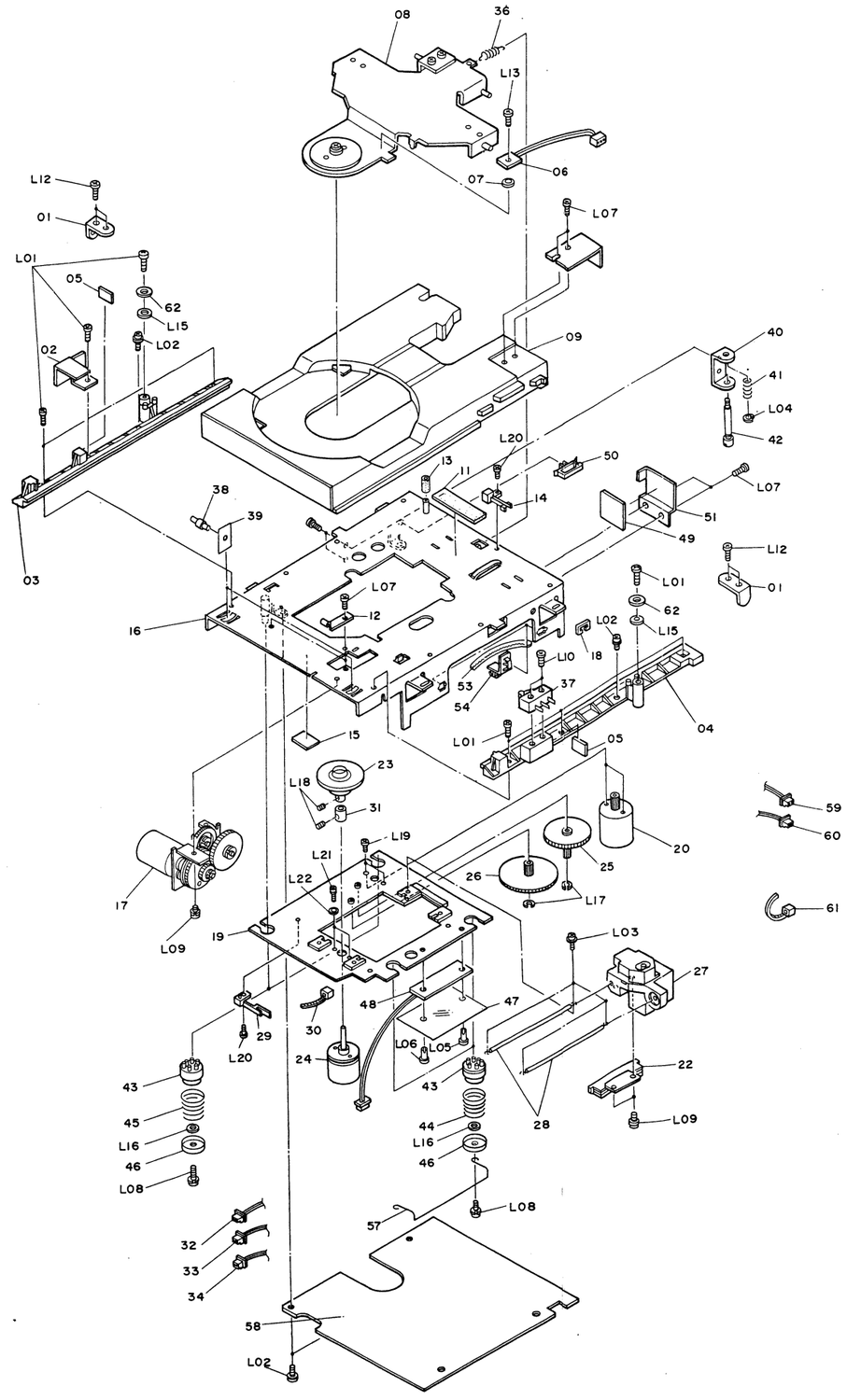


4.5. Bottom Cover Ass'y



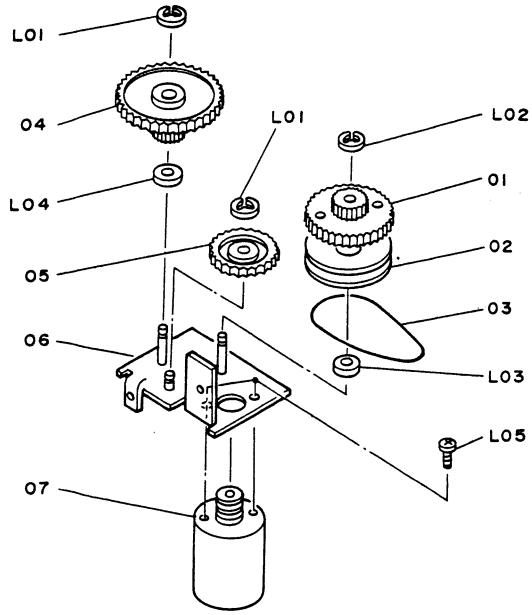
Schematic Ref. No.	Part. No.	Description	Q'ty
	CA80518A	**Front Panel Ass'y (OMS-4)**	
	CA80430A	**Front Panel Ass'y (OMS-4A)**	
	CA80510A	**Front Panel Ass'y (OMS-4E)**	
	CA80509A	**Front Panel Ass'y (OMS-40)**	
01	0C81650A	Front Panel (OMS-4)	1
	0C81601A	Front Panel (OMS-4A)	1
	0C81606A	Front Panel (OMS-4E)	1
	0C81607A	Front Panel (OMS-40)	1
02	0C81506A	Play Button	1
03	0C81507A	Pause Button	1
04	0C81510A	R. Skip Button	1
05	0C81511A	F. Skip Button	1
06	0C81508A	Eject Button	1
07	0C81509A	Stop Button	1
08	0C81512A	Rev. Button	1
09	0C81513A	F. Fwd. Button	1
10	0C81514A	Push Button	5
11	0C81567A	Button Spring	5
12	0C81502A	Front Escutcheon R	1
13	0C81503A	LED Filter	2
14	0C81602A	Acrylic Cover	1
15	0C81504A	Front Escutcheon L	1
16	0C82354A	Adhesive Tape	2
17	CA80414A	Control & Display P. C. B. Ass'y	1
18	0C81597A	Top Cover Cushion F	3
	0C82388A	Spacer A	1
	0C82389A	Spacer B	1
	0C82390A	Spacer C	1
	0C82391A	Spacer D	1
L01	0E00868A	BT3×8⊕Binding	1
	CA80511A	**Top Cover Ass'y**	
01	0C81483A	Top Cover	1
02	0C81582A	BS Damper A	1
03	0C81598A	Top Cover Cushion R	2
04	0C81652A	Cushion	1
05	0C82350A	BS Damper B	2
06	0C82352A	Rubber Cushion	1
	CA80512A	**Bottom Cover Ass'y**	
01	0C81561A	Bottom Cover	1
02	0C81479A	Leg	4
L01	0E00888A	BT3×12⊕Binding	4

4.6. Disc Mechanism Ass'y

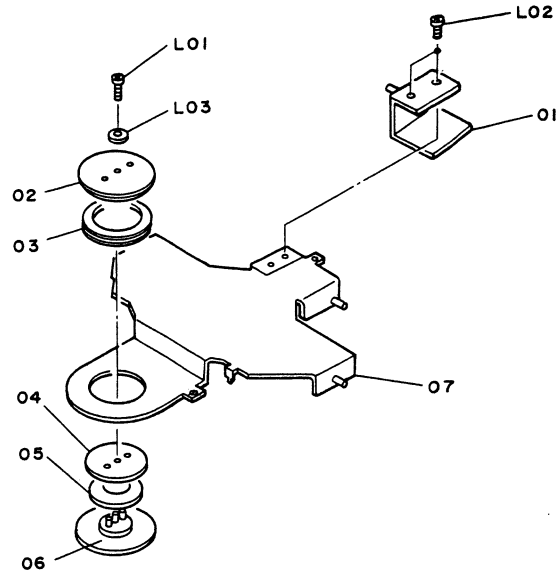


Schematic Ref. No.	Part No.	Description	Q'ty
	CA80436A	**Disc Mechanism Ass'y**	
01	0C81560A	Chuck Arm Plate	1
02	0C82346A	Disc Tray Guide Plate	1
03	0C81493A	Disc Drawer Guide L	1
04	0C81494A	Disc Drawer Guide R	1
05	0C81589A	Stopper Rubber	2
06	CA80422A	Photo Transistor P. C. B. Ass'y	1
07	0C82349A	Collar	1
08	CA80428A	Chuck Arm Ass'y	1
09	CA80395A	Disk Tray Ass'y	1
10	0C82348A	Disk Tray Plate	1
11	0C81591A	Chuck Cushion	1
12	0C81542A	Disk Support Stopper	2
13	0C81585A	Stopper Cushion	1
14	0C81887A	Leaf Switch MSW1275	1
15	0C81592A	Vibration Isolating Sheet	1
16	CA80399A	Disk Mechanism Chassis Ass'y	1
17	CA80393A	Loading Gear Ass'y	1
18	0C81474A	Wire Clamper	2
19	CA80401A	Sub Chassis B Ass'y	1
20	CA80521A	Feed Motor Ass'y	1
22	CA80391A	Feed Rack Ass'y	1
23	CA80400A	Turntable B Ass'y	1
24	0C81938A	Disc Motor RF-310	1
25	0C81497A	Feed Gear A	1
26	0C81498A	Feed Gear B	1
27	0C81936A	Laser Pickup Ass'y KSS-121B	1
28	0C81535A	Pickup Rail	2
29	0C81888A	Leaf Switch	1
30	0C81660A	Wire Clamper	1
31	0C81558A	Collar	1
32	0C81912A	2P Connector N	1
33	0C81921A	2P Connector Q	1
34	0C81913A	2P Connector E	1
36	0C81557A	Chuck Arm Spring	1
37	0C81886A	Microswitch SS-5GL13	1
38	CA80392A	Roller Ass'y	4
39	0C81543A	Roller Stopper	2
40	0C81544A	Shipping Screw Holder	1
41	0C81538A	Shipping Screw Spring	1
42	0C81545A	Shipping Screw	1
43	0C81536A	Cushion	4
44	0C81536A	Cushion Spring A	4
45	0C81540A	Cushion Spring B	1
46	0C81537A	Cushion Holder	4
47	0C81585A	Insulator	1
48	CA80515A	Photo Diode P. C. B. Ass'y	1
49	0C81588A	Magnet Rubber	1
50	0C82413A	Wire Clamper	1
51	0C82414A	Disc Tray Lock Plate	1
53	0C81475A	Free Bushing 100mm	1
54	0C81473A	P. C. B. Support	2
57	0C81559A	Guide Spring	1
58	CA80405A	Servo P. C. B. Ass'y	1
59	0C81914A	2P Connector G	1
60	0C81915A	2P Connector H	1
61	0C81471A	Insu-Lock L=94mm	6
62	0C82387A	Collar	2
L01	0E00868A	BT3×8⊕Binding	8
L02	0E03157A	BT3×8⊕Binding With Washer	4
L03	0C81646A	BT2.6×8⊕Binding With Washer	6
L04	0E00134A	E-Ring 4mm	1
L05	0C81662A	Plastic Rivet	1
L06	0C81656A	Plastic Rivet 3×8	1
L07	0E03393A	ST2.6×8⊕Binding	4
L08	0E03416A	M2.6×5⊕Pan (2A)	6
L09	0C81622A	M2.6×4⊕Pan (2A)	2
L10	0C81945A	M2×12⊕Pan	2
L11	0C81624A	Washer	2
L12	0E00792A	BT2.6×6 Pan	6
L13	0E00121A	M2.6×6⊕Pan	1
L14	0C81948A	Washer 3mm Spring	1
L15	0C82386A	Washer 6×11×1.0(Rubber)	2
L16	0E00071A	Washer 3mm Fiber	4
L17	0C81629A	Washer Plastics2.6×4.6×0.5(Cut)	2
L18	0C81639A	M2×3 Hex Socket Head	2
L19	0C81640A	M2×11.5(4)Cylinder Head	2
L20	0C81940A	M2×6⊕Pan	2
L21	0C81944A	BT2×8⊕Pan	2
L22	0C81947A	Washer 2mm Spring	2

4.7. Loading Gear Ass'y



4.8. Chuck Arm Ass'y



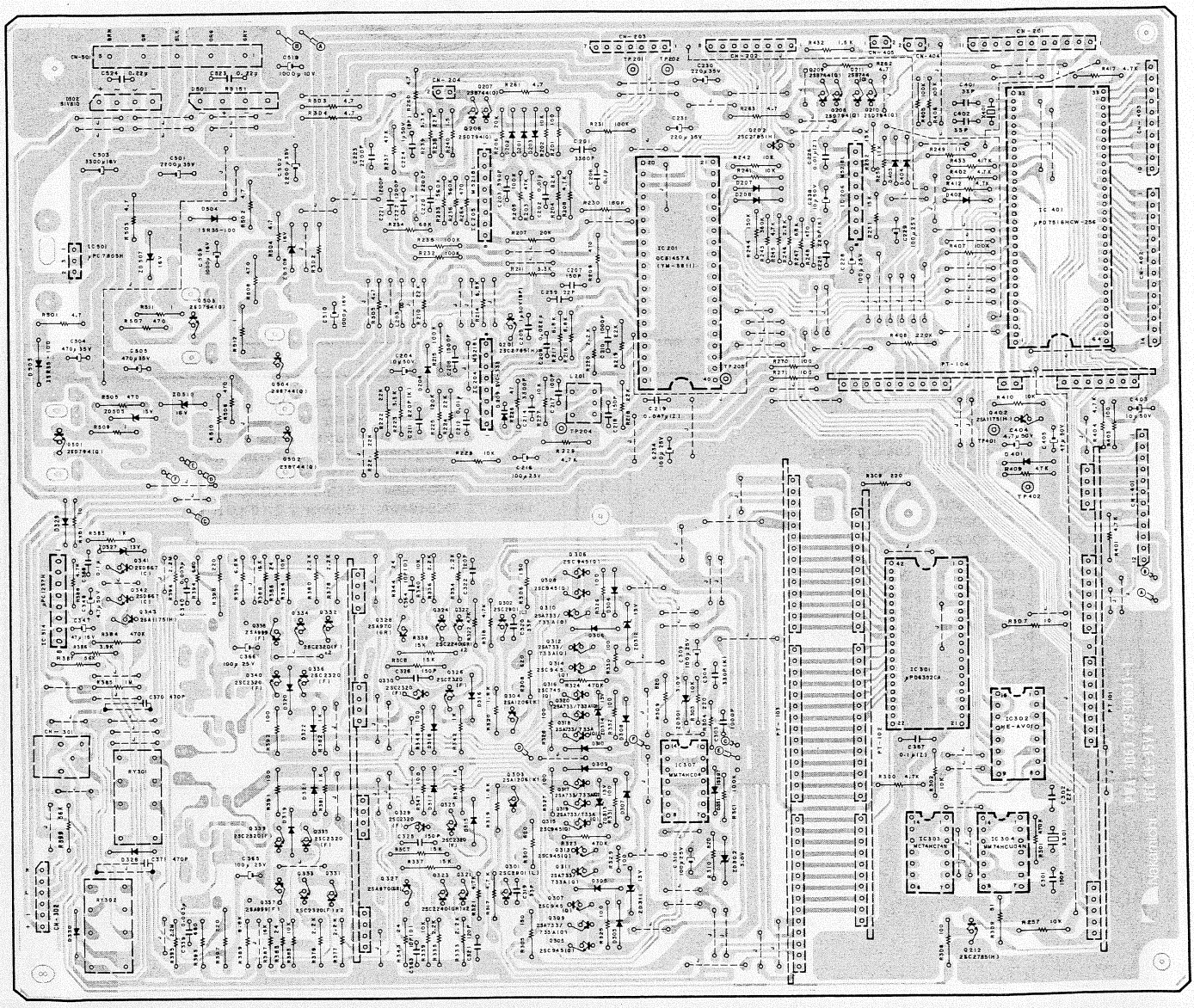
Schematic Ref. No.	Part No.	Description	Q'vy
	CA80428A	**Loading Gear Ass'y**	
01	0C81491A	Loading Gear A	1
02	0C81477A	Loading Pulley	1
03	0C81478A	Loading Belt	1
04	0C81484A	Loading Gear B	1
05	0C81485A	Loading Gear C	1
06	CA80397A	Loading Gear Holder Ass'y	1
07	CA80523A	Loading Motor Ass'y	1
L01	0E00181A	E-Ring 3mm	2
L02	0C81638A	Washer Plastics 4.1×6.5×0.5(Cut)	1
L03	0E03393A	Washer FT 6.2×0.13	1
L04	0C82342A	Washer Plastics 4.1×7×0.5	1
L05	0E00622A	M3×5⊕Pan(2A)	2
	CA80428A	**Chuck Arm Ass'y**	
01	CA80402A	Chuck Base Ass'y	1
02	0C81496A	Chuck B	1
03	0C81590A	Chuck Rubber	1
04	0C81534A	Chuck Yoke	1
05	0C81481A	Ring Magnet B	1
06	0C81501A	Magnet Holder B	1
07	CA80403A	Chuck Arm Base Ass'y	1
L01	0E03124A	BT2×5⊕Pan	1
L02	0E03393A	ST2.6×8⊕Binding	2
L03	0C81946A	Washer 2.2×5×0.3	1

5. MOUNTING DIAGRAMS AND PARTS LIST

5.1. Main P.C.B. Ass'y

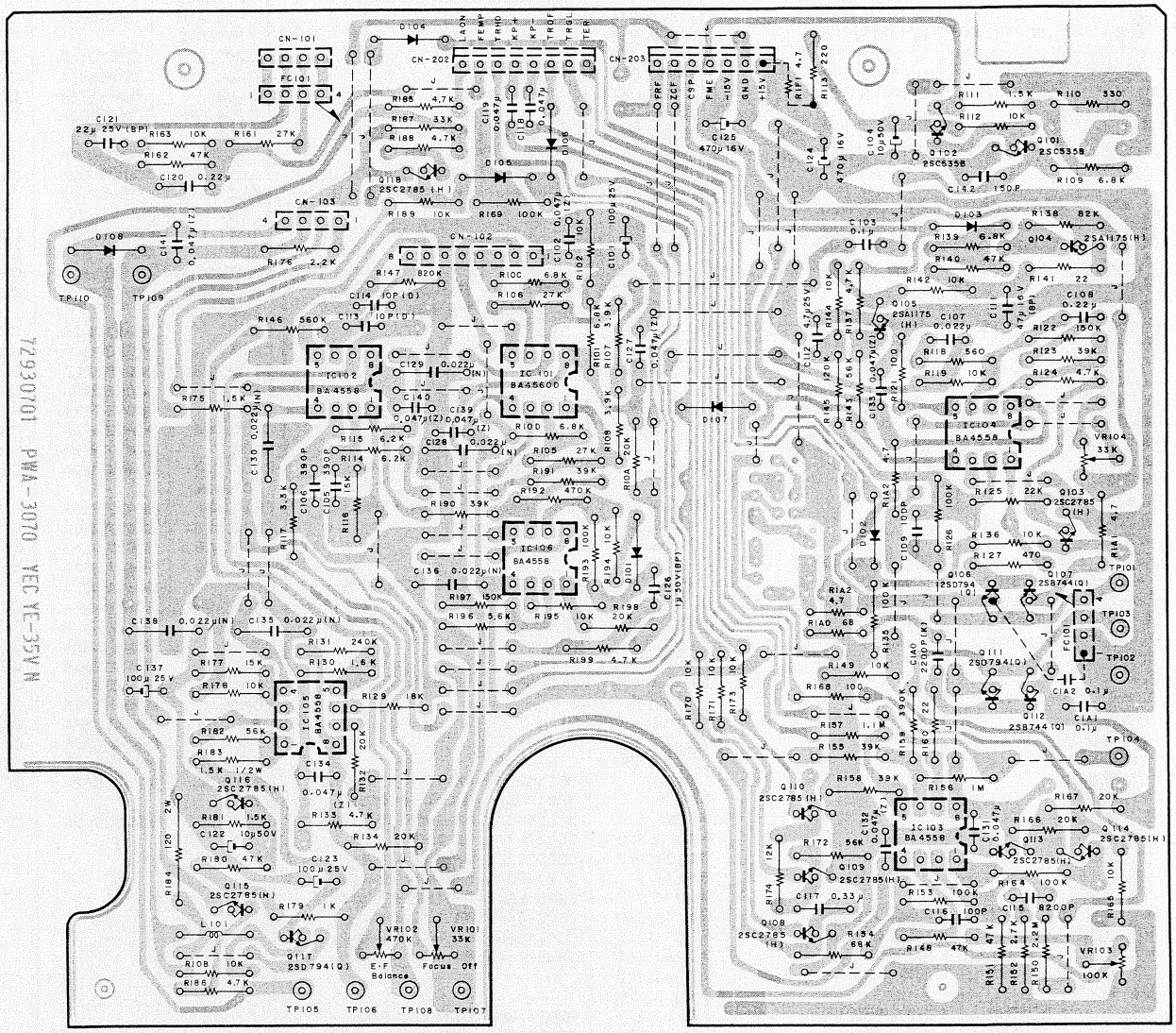
Notes:

1. Mounting diagram shows a dip side view of the printed circuit board.
2. Diode is 1S2473 unless otherwise specified.
3. Abbreviation for part name:
   TR – Transistor, SiD – Silicon Diode, Varicap – Variable Capacitance Diode
   RK – Carbon Resistor, RM – Metal Film Resistor, RF – Fail Safe Type Resistor
   CE – Electrolytic Capacitor, CM – Mylar Capacitor, CC – Ceramic Capacitor,
   CT- Tantalume Capacitor, C- Mica Capacitor
   CF – Film Capacitor
   CSP – Polystyrene Capacitor
   CMM – Metalliged Mylar Capacitor



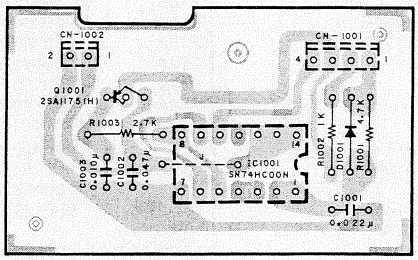
Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	CA80409A	**Main P. C. B. Ass'y**	R201, 320	0B01679A	RK 100 1/4W J	R393, 394	0B05794A	RK 680 1/4W J
			325, 326			R395, 396	0B05671A	RK 2.2M 1/4W J
IC201	0C81457A	IC YM-3811	327, 328			R397, 398	0B20397A	RK 220 1/2W F
IC204, 205	0C81695A	IC M5218L	330, 331			R399, 3B7	0B05508A	RK 56K 1/4W J
206			332, 347			R408	0B05625A	RK 220K 1/4W J
IC301	0C81710A	IC µPD6352CA	348, 391			R432	0B05698A	RK 1.5K 1/4W J
IC302	0C81708A	IC HE-AV01	392, 3D8			R501, 504	0B09321A	RF 4.7 1/4W J
IC303	0C81706A	IC MM74HC74N	403			R505, 506	0C81715A	RF 470 1/4W J
IC304	0C82288A	IC MM74HCL104N	R202, 227	0B01888A	RK 10K 1/4W J	507, 508		
IC307	0C81707A	IC MM74HC04N	228, 241			R509, 510	0B05695A	RK 1 1/4W J
IC314	0C81699A	IC UPC1237H	242, 257			511, 512		
IC401	0C81705A	IC µPD7516HCW-256	302, 303			C201, 214	0B01914A	CM 3300PF 50V J
Q201, 202	0C81667A	S-TR 2SC2785	339, 340			C202, 212	0B05681A	CM 0.01UF 50V J
Q206, 208	0C81676A	S-TR 2SD794Q	383, 384			C203	0B41738A	CC 390PF 50V J
210, 501			410			C204, 238	0B40289A	CE 10UF 50V
503			R203, 237	0B05641A	RK 47K 1/4W J	403		
Q207, 209	0C81664A	S-TR 2SD744Q	409			C205, 224	0B09157A	CE 1UF 50V (BP)
211, 502			R204	0B05668A	RK 82K 1/4W J	C206, 368	0B01780A	CM 0.1UF 50V J
504			R205, 215	0B01889A	RK 100K 1/4W J	C207, 218	0B41743A	CC 150PF 50V J
Q301, 302	0C81674A	S-TR 2SC2901L	231, 232			301		
Q303, 304	0C81670A	S-TR 2SA1206K	235, 3C1			C208	0B05653A	CM 1500PF 50V J
Q305, 306	0B06251A	S-TR 2SC945Q	405, 406			C209	0B05582A	CM 0.022UF 50V J
307, 308			407			C210,303	0B05550A	CF 1000PF 50V J
313, 314			R206, 207	0B09509A	RK 20K 1/4W J	C216,228	0B01272A	CE 100UF 25V
315, 316			R208, 229	0B01846A	RK 4.7K 1/4W J	229, 234		
Q309, 310	0B06013A	S-TR 2SA733	245, 317			C217	0B41742A	CC 100PF 50V J
311, 312			318, 321			C219	0B09387A	CC 0.047UF 50V Z
317, 318			322, 3B8			C220, 223	0B01802A	CM 2200PF 50V J
319, 320			3D0, 401			C226	0B09290A	CC 0.01UF 50V Z
Q321, 322	0B10078A	S-TR 2SC2240GR	402, 404			C230, 231	0B05831A	CE 220µF 35V
323, 324			412, 417			C239, 302	0B09279A	CC 22PF 50V J
Q325, 326	0C80672A	S-TR 2SC2320F	433			C304	0B41756A	C 330PF 50V K
329, 330			R209, 248	0B05596A	RK 470 1/4W J	C309, 310	0B40429A	CE 100PF 25V (LN)
331, 332			264			365, 366		
333, 334			R210, 218	0B05615A	RK 22K 1/4W J	C319,320	0B41758A	C 33PF 100V J
335, 336			219, 221			C321, 322	0B41759A	C 120PF 100V J
339, 340			222, 224			C325, 326	0B51754A	CSP 150P 15V J
Q327, 328	0B06180A	S-TR 2SA970GR	238			C339, 340	0B41753A	CSP 3000P 16V J
Q337, 338	0C81669A	S-TR 2SA999F	R211, 223	0B01681A	RK 3.3K 1/4W J	C347	0B01403A	CE 47UF 16V
Q341, 342	0C81675A	S-TR 2SD667C	239			C348, 404	0B40201A	CE 4.7UF 50V
Q343, 402	0C81666A	S-TR 2SA1175	R214, 216	0B01682A	RK 6.8K 1/4W J	C363, 364	0B41757A	C 10PF 100V D
D201, 202	0B12248A	Si-D 1S2473	217, 389			C367	0B09292A	CC 0.1UF 50V Z
203, 204			390			C370, 371	0B41196A	CSP 470P 160V
207, 208			R220, 246	0B05622A	RK 2.2K 1/4W J	C401, 402	0B41740A	CC 33PF 50V J
303, 304			333, 334			C405	0B40119A	CE 47UF 50V
307, 308			335, 336			C501, 502	0B82358A	CE 2200UF 35V
309, 310			377, 378			C503	0B40235A	CE 3300UF 16V
315, 316			379, 380			C504, 505	0B40107A	CE 470UF 35V LN
317, 318			R225	0B05621A	RK 120K 1/4W J	C509, 510	0C40082A	CE 1000UF 16V
319, 320			R226	0B01706A	RK 47 1/4W J	519		
321, 322			R230	0B05640A	RK 180K 1/4W J	C523,524	0C82305A	CF 0.22UF 50V J
328, 329			R233, 236	0B05784A	RK 560K 1/4W J			
330, 401			R234, 247	0B05692A	RK 68K 1/4W J			
402, 403			R243	0B20400A	RK 360K 1/4W J			
404			R244	0B05626A	RK 150K 1/4W J			
D209	0C81677A	Varicap SVC333	R249, 250	0B09334A	RK 11K 1/4W J			
D301, 302	0C81687A	ZD RD3.0EB1 (A)	R251, 252	0B01683A	RK 15K 1/4W J			
D305, 306	0B12248A	Si-D 1S2473	R260, 261	0B09671A	RK 4.7 1/4W J			
D311, 312	0B12176A	ZD RD13JB1	262, 263					
313, 314			3D3, 3D4					
D327	0C81689A	ZD RD13EB1 (A)	R270, 271	0B01713A	RK 33 1/4W J			
D3S1	0C82294A	Si-D 1SS97	R301, 323	0B01684A	RK 470K 1/4W J			
D501	0B06183A	Si-D RB151	324, 3B4					
D502	C081681A	Si-D S1VB10	R304	0B05930A	RF 220 1/4W J			
D503, 504	0B12365A	Si-D 1SR35-100	R305, 306	0B05795A	RK 150 1/4W J			
D505, 506	0C81690A	ZD RD16EB1 (A)	R307, 308	0B09882A	RK 620 1/4W J			
507, 508			R309, 310	0B24128A	RF 820 1/4W J			
X301	0C81884A	XTAL 8.6436MHz	R319, 320	0B05614A	RK 1.8K 1/4W J			
X401	0C81883A	Ceramic Resonator 4MHz	R337, 338	0B01683A	RK 15K 1/4W J			
3B5	0B05776A	RK 1M 1/4W J	3C7, 3C8					
3B6	0B05675A	RK 3.9K 1/4W J	R341, 342	0B01857A	RK 1.0K 1/4W J			
R3C9	0B05930A	RF 220 1/4W J	381, 382					
R3D1	0B05936A	RF 10 1/4W J	3B3					
R3D9	0B20403A	RK 51 1/4W J	R343, 344	0B20402A	RK 24 1/4W J			
RY301, 302	0C81889A	Relay RKT-12	385, 386					
			R387, 388	0B20399A	RK 16K 1/4W J			

5.2. Servo P.C.B. Ass'y

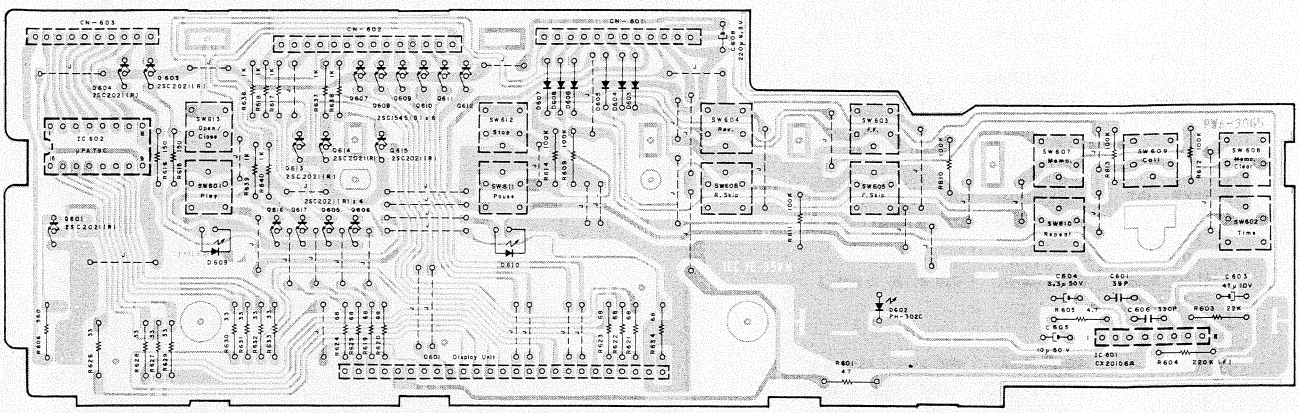


Schematic Ref. No.	Part Oo.	Description	Schematic Ref. No.	Part No.	Description
	CA80405A	**Servo P. C. B. Ass'y**	R145	0B05621A	RK 120K 1/4W J
			R147	0B09320A	RK 820K 1/4W J
IC101	0B11277A	IC BA4560-D	R150	0B05671A	RK 2.2M 1/4W J
IC102, 103	0B11266A	IC BA4558	R152	0B05629A	RK 2.7K 1/4W J
104, 105			R154	0B05692A	RK 68K 1/4W J
106			R156	0B05776A	RK 1M 1/4W J
Q101, 102	0C81671A	S TR 2SC535B	R157	0B05961A	RK 1.1M 1/4W J
Q103, 108	0C81667A	S TR 2SC2785 H	R159	0B05676A	RK 390K 1/4W J
109, 110			R176	0B05622A	RK 2.2K 1/4W J
113, 114			R179	0B01857A	RK 1K 1/4W J
115, 116			R183	0B05698A	RK 1.5K 1/4W J
118			R184	0C81717A	RM 120 1/4W J
Q104, 105	0C81666A	S TR 2SA1175 H	R187	0B05509A	RK 33K 1/4W J
Q106, 111	0C81676A	S TR 2SD794 Q	R192	0B01684A	RK 470K 1/4W J
117			R196	0B01887A	RK 5.6K 1/4W J
Q107, 112	0C81664A	S TR 2SB744 Q	C101, 123	0B01272A	CE 100UF 25V
D101, 102	0B12248A	SI-D 1S2473	1A0		
103, 104			C102, 131	0B09387A	CC 0.047UF 50V Z
105, 106			132, 133		
107, 108A			134		
VR101	0C81789A	Semi VR 33K	C103, 1A1	0B01780A	CM 0.1UF 50V J
VR102	0C81790A	Semi VR 470K	C104, 122	0B40289A	CE 10UF 50V
VR103	0C81791A	Semi VR 100K	C105, 106	0B41738A	CC 390PF 50V J
VR104	0C81787A	Semi VR 33K	C107	0B05582A	CM 0.022UF 50V J
W202	0C81919A	8P Connector Cord	C113, 114	0B09277A	CC 10PF 50V D
W203	0C81918A	7P Connector Cord	C115	0B05814A	CM 8200PF 50V J
R1A1, 1A2	0B09671A	RK 4.7 1/4W J	C116	0B41735A	CC 100PF 50V J
L101	0C81880A	Coil 10μH (K)	C119	0B05796A	CM 0.047UF 50V J
R10A, 198	0B09509A	RK 20K 1/4W J	C128, 129	0C81836A	CC 0.022UF 16V N
1A0	0B01704A	RK 68 1/4W J	130, 135		
R101, 109	0B01682A	RK 6.8K 1/4W J	136, 138		
10C, 10D					
139					
R102, 10B	0B01888A	RK 10K 1/4W J			
112, 119					
R105, 106	0B05743A	RK 27K 1/4W J			
161					
R107, 108	0B05675A	RK 3.9K 1/4W J			
R110	0B05577A	RK 3.30 1/4W J			
R111, 175	0B05698A	RK 1.5K 1/4W J			
181					
R113	0B01933A	RK 220 1/4W J			
R114, 115	0B09271A	RK 6.2K 1/4W J			
R116, 177	0B01683A	RK 15K 1/4W J			
R117	0B01681A	RK 3.3K 1/4W J			
R118, 146	0B05575A	RK 560 1/4W J			
R121	0B01679A	RK 100 1/4W J			
R122, 197	0B05626A	RK 150K 1/4W J			
R123, 155	0B01854A	RK 39K 1/4W J			
158, 190					
191					
R124, 133	0B01846A	RK 4.7K 1/4W J			
137, 185					
186, 188					
199					
R125	0B05615A	RK 22K 1/4W J			
R126, 193	0B01889A	RK 100K 1/4W J			
R127	0B05576A	RK 470 1/4W J			
R129	0B05560A	RK 18K 1/4W J			
R130	0B09565A	RK 1.6K 1/4W J			
R131	0B09483A	RK 240K 1/4W J			
R132, 134	0B09509A	RK 20K 1/4W J			
166, 167					
R135, 153	0B01889A	RK 100K 1/4W J			
164, 168					
169					
R136, 142	0B01888A	RK 10K 1/4W J			
144, 149					
163, 165					
170, 171					
173, 178					
189, 194					
195					
R138	0B05668A	RK 82K 1/4W J			
R140, 148	0B05641A	RK 47K 1/4W J			
151, 162					
180					
R141, 160	0B05579A	RK 22K 1/4W J			
R143, 172	0B05508A	RK 56K 1/4W J			
182					

5.3. Search P.C.B. Ass'y



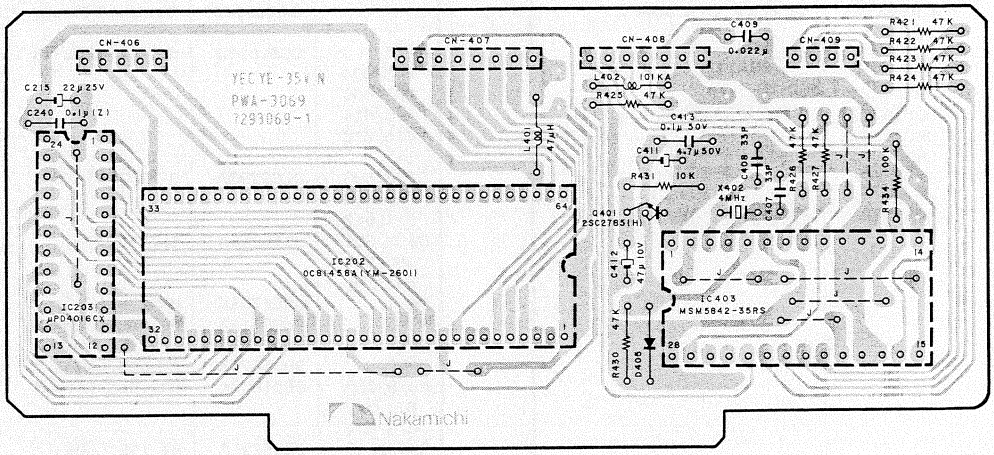
5.4. Control & Display P.C.B. Ass'y



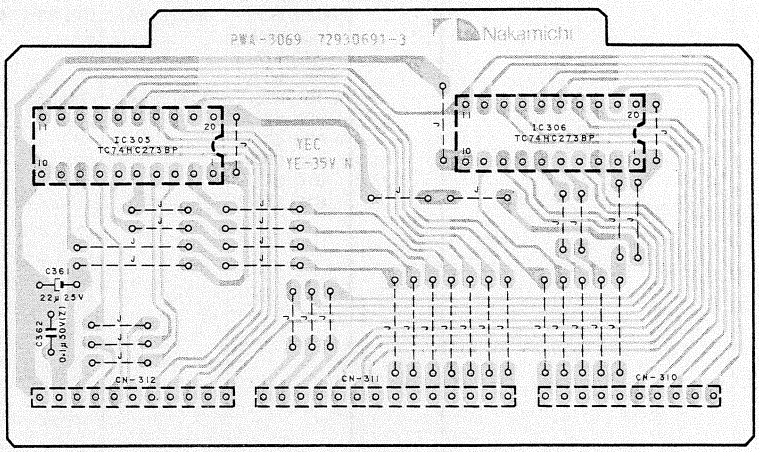
Schematic Ref. No.	Part No.	Description
	CA80514A	**Search P. C. B. Ass'y**
IC1001	0C81693A	IC SN74HC00N
Q1001	0C81666A	S-TR 2SA1175 H
D1001	0B12248A	SI-D 1S-2473
R1001	0B01846A	RK 4.7K 1/4W J
R1002	0B01857A	RK 1K 1/4W J
R1003	0B05629A	RK 2.7K 1/4W J
C1001	0B05582A	CM 0.022UF 50V J
C1002	0B09387A	CC 0.047UF 50V Z
C1003	0B05681A	CM 0.010UF 50VJ

Schematic Ref. No.	Part No.	Description
	CA80414A	**Control & Display P. C. B. Ass'y**
Q601, 603, 604 605, 606 613, 614 615, 616 617	0C81668A	S-TR 2SC2021 R
Q607, 608 609, 610 611, 612	0C82293A	S-TR 2SC1545B
D603, 604 605, 606 607,608	0B12248A	SI-D 1S2473
R601	0B01706A	RK 47 1/4W J
R603	0B05615A	RK 22K 1/4W J
R605	0B09671A	RK 4.7K 1/4W J
R606	0B05575A	RK 560 1/4W J
R609, 610 611, 612 613, 614	0B01889A	RK 100K 1/4W J
R615, 616	0B05795A	RK 150 1/4W J
R617, 618 636, 637 638, 639 640	0B01857A	RK 1K 1/4W J
R619, 620 621, 622 623, 624 625, 634	0B01704A	RK 68 1/4W J
R626, 627 628, 629 630, 631 632, 633	0B01713A	RK 33 1/4W J
S602, 603 604, 605 606, 607 608, 609 610, 611 612, 613	0C81885A	Tact SW

5.5. SIGNAL Process P.C.B. Ass'y

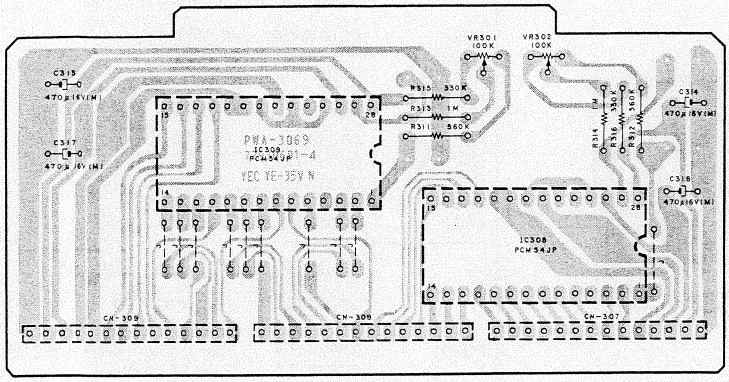


5.6. D F/F P.C.B. Ass'y

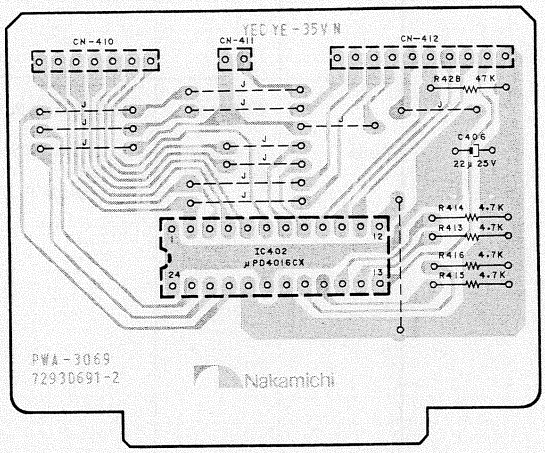


Schematic Ref. No.	Part No.	Description	Schematic Ref. No.	Part No.	Description
	CA80406A	**Signal Process Ass'y**		**CA80412A**	**D F/F P. C. B. Ass'y**
IC202	0C81458A	IC YM-2601	IC305, 306	0C82292A	TC 74HC 273P
IC203	0C81709A	IC UP04016CX	C361	0B40221A	CE 22UF 25V
IC403	0C81702A	IC MSM5842-35RS	C362	0B09292A	CC 0.1μF 50V Z
L401, 402	0C82332A	Coil 100μH (K)			
Q401	0C81667A	S-TR 2SC2785 H			
D405	0B12248A	SI-D 1S2473			
R421, 422	0B01706A	RK 47K 1/4W J			
423, 424					
425, 426					
427, 430					
R431	0B01888A	RK 10K 1/4W J			
R434	0B01889A	RK 100K 1/4W J			
C362, 413	0B09292A	CC 0.1UF 50V Z			
X402	0C81883A	Ceramic Resonator 4MHz			
C407, 408	0B41073A	CC 33PF 50V K			
C409	0B05582A	CM 0.022μF 50V J			
C411	0B40201A	CE 4.7UF 50V			
C412	0B40441A	CE 47UF 10V			

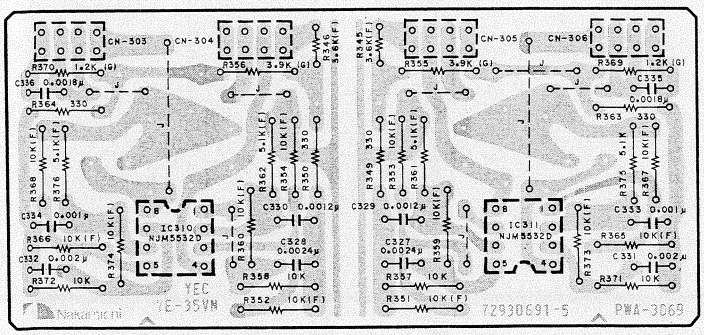
5.7. DAC P.C.B. Ass'y



5.8. RAM P.C.B Ass'y

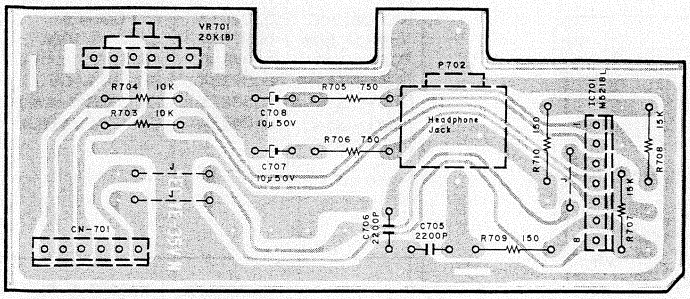


5.9. Analog Filter P.C.B. Ass'y

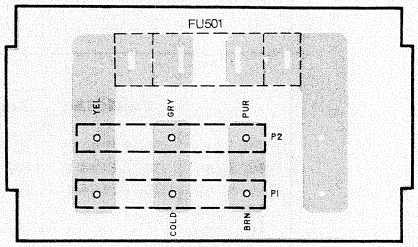


Schematic Ref. No.	Part No.	Description
	CA80413A	**DAC P. C. B. Ass'y**
IC308, 309	0C82291A	IC PCM54JP
VR301, 302	0C81788A	Semi VR 100K
R311, 312	0B05784A	RK 560K 1/4W J
R313, 314	0B05776A	RK 1M 1/4W J
R315, 316	0B05627A	RK 330K 1/4W J
C313, 314 317, 318	0B40437A	CE 470μ 16V(LN)
	CA80407A	**RAM P. C. B. Ass'y**
IC402	0C81709A	IC UPD4016CX
R413, 414 415, 416	0B01846A	RK 4.7K 1/4W J
R428	0B05641A	RK 47K 1/4W J
C406	0B40221A	CE 22UF 25V
	CA80415A	**Analog Filter P. C. B. Ass'y**
IC310, 311	0B11278A	IC NJM 5532D
R345, 346	0C81718A	RM 3.6K 1/4W F
R351, 352 353, 354 359, 360 365, 366 367, 368 373, 374	0C81719A	RM 10K 1/4W F
R349, 350 363, 364	0B05577A	RK 330 1/4W J
R355, 356	0C81722A	RK 3.9K 1/3W G
R357, 358 371, 372	0B01888A	RK 10K 1/4W J
R361, 362 375, 376	0B09795A	RM 5.1K 1/4W F
R369, 370	0C81721A	RK 1.2K 1/3W G

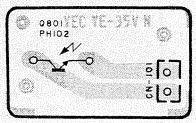
5.10. Headphone Amp P.C.B. Ass'y



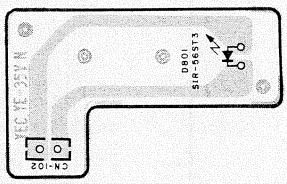
5.11. Terminal P.C.B. Ass'y



5.12. Photo Transistor P.C.B. Ass'y



5.13. Photo Diode P.C.B. Ass'y



Schematic Ref. No.	Part No.	Description
	CA80410A	**Headphone P. C. B. Ass'y**
IC901	0C81695A	IC M5218 L
VR901	0C81786A	VR 20KA
R901, 902	0B05936A	RF 22 1/4W J
R903, 904	0B01888A	RK 10K 1/4W J
R905, 906	0B01683A	RK 15K 1/4W J
R907, 908	0B09924A	RK 750 1/4W J
R909, 910	0B05795A	RK 150 1/4W J
C905,906	0B41233A	CP 2200pF 100V J
C907, 908	0B040289A	CE 10UF 50V
P901	0C81891A	Headphone Jack
	CA80416A	**Terminal P. C. B. Ass'y**
	0C81902A	3P Terminal ②
	—	Terminal P. C. B.
FU501	0C82415A	Fuse 630mA 250V (OMS-4E)
	0C82412A	Fuse 1A 250V (OMS-4/4A/40)
	CA80422A	**Photo Transistor P. C. B. Ass'y**
TR801	0C81680A	Photo TR PH-102
	0C81915A	2P Connector Cord
	—	Photo Transistor P. C. B.
	CA80515A	**Photo Diode P. C. B. Ass'y**
D801	0C82337A	LED SIR-56ST3
	0C81926A	2P Post
	—	Photo Diode P. C. B.

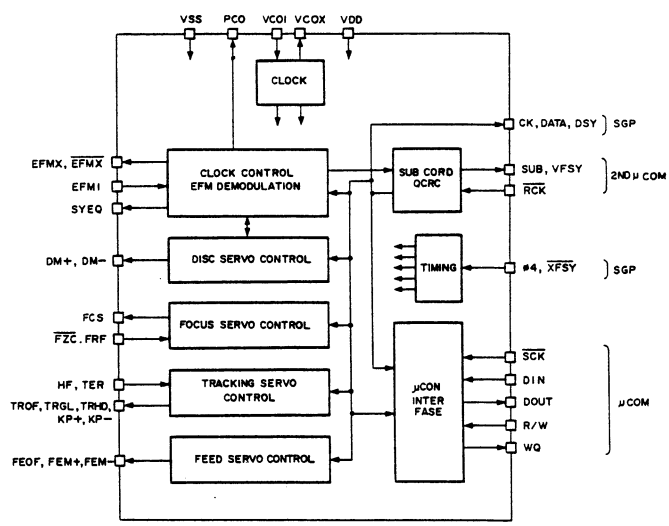
6. IC BLOCK DIAGRAM

IC201 Terminal Functions

Terminal number	Terminal code	I/O	Outline of functions
1	VDD	I	+5V power supply terminal
2 3	VCOX VCOI	0 I	The LC resonance circuit is connected between these terminals. These terminals are used for the VCO clock oscillation (average 8.6436MHz).
4	PCO	0	This is the VCO clock control output terminal. This sets the VCO clock oscillation circuit so that the frequency increases when the average DC voltage between these terminals is high.
5 20	VCC VSS	I I	These are the grounding terminals.
6 7	$\overline{\text{EFMX}}$ EFMX	0 0	Connect to the EFM signal slice level control circuit. This is the amplification-limited EFM signal output terminal. 8 > 7. The gain of 7 > 6 is 15.
8	EFMI	I	EFMI signal (1 – 2 VPP) into this terminal
9	SYEQ	0	This is the monitor output terminal that gives a "H" level signal when the synchronization signal of the EFM signal and the synchronization signal of the internal counter correspond.
10 11	DM + DM -	0 0	These are the DISC Motor output terminals, connected to the disc motor driver circuit. It is not possible for both terminals to register "H" simultaneously.
12	FCS	0	This is the focusing output terminal.
13	$\overline{\text{FZC}}$	I +	Based on the focus error signal, an "L" signal will be input when the focus point is reached.
14	FRF	I	An "H" signal will be entered into this terminal when reflected light is received.
15	HF	I	The EFM envelope signal (amplitude logic level) is entered into this terminal.
16	TER	I	The tracking error signal (amplitude logic level) is entered into this terminal.
17	$\overline{\text{TEST}}$	I +	This test terminal is to be grounded, and contains pull-up resistors.
34	TCL	I +	This test terminal is ungrounded, and contains pull-up resistors.
18	TROF	0	This is the output terminal that switches off the tracking signal of the tracking servo circuit.
19	TRGL	0	This output terminal minimizes the gain of the tracking servo circuit.
20	TRHD	0	This output terminal holds the tracking error signal of the tracking servo circuit while KP+ or KP- (see below) are being output.
22 23	KP + KP -	0 0	These output terminals are for the track kick function, and are connected to the tracking servo circuit.
24	FEOF	0	This output terminal is used to switch off the input signal of the feed servo circuit.
25 26	FEM + FEM -	0 0	This request output terminal is connected to MPU, and requests that connected to the feed servo circuit.
27	WQ	0	This request output terminal is connected to MPU, and requests that data be sent from SVC > MPU.

Terminal number	Terminal code	I/O	Outline of functions
28	R/W	0	This output terminal is connected to MPU, and is used for the switching of the data transmission mode. When R/W = "L", data is transmitted from SVC > MPU, and when R/W = "H", data is transmitted from MPU > SVC.
29	DOUT	0	This data output terminal is connected to MPU. When R/W = "L", data can be transmitted from SVC > MPU according to the SCK clock input.
30	DIN	I	This data input terminal is connected to MPU. When R/W = "H", data is transmitted from MPU > SVC according to the SC key clock input.
31	SCK	I	Connected to MPU, this terminal is for the clock input, required for data transmission.
32	XFSY	I	This is the frame synchronization signal (7.35kHz) input terminal, connected to the SCG output.
33	ϕ4	I	This is the crystal clock (4.321MHz) input terminal, connected to the SGP output.
35	RCX	I +	Connected to MPU, this terminal is for the clock input, required for the subcode transmission. It is disconnected when not being used.
36	VFSY	0	This is the VCO frame synchronization signal (average 7.35kHz) output terminal, connected to MPU. Detecting the change form "H " > "L", this can be used as a request signal, requesting that the subcode be transmitted from SVC > MPU.
37	SUB	0	This is the subcode output terminal, connected MPU. The subcode can be transmitted from SVC > MPU according to the $\overline{RCK}$ clock input.
38	DSY	0	This is the synchronization signal output terminal for the serial signals (see below), connected to the SGP input.
39	DATA	0	This is the serial signal output terminal for the 8 bit EFM demodulation signals and the 5 bit control signals, connected to the SGP input.
40	CK	0	This is the VCO clock (average 4.3218MHz) output terminal, connected to the SGP input.

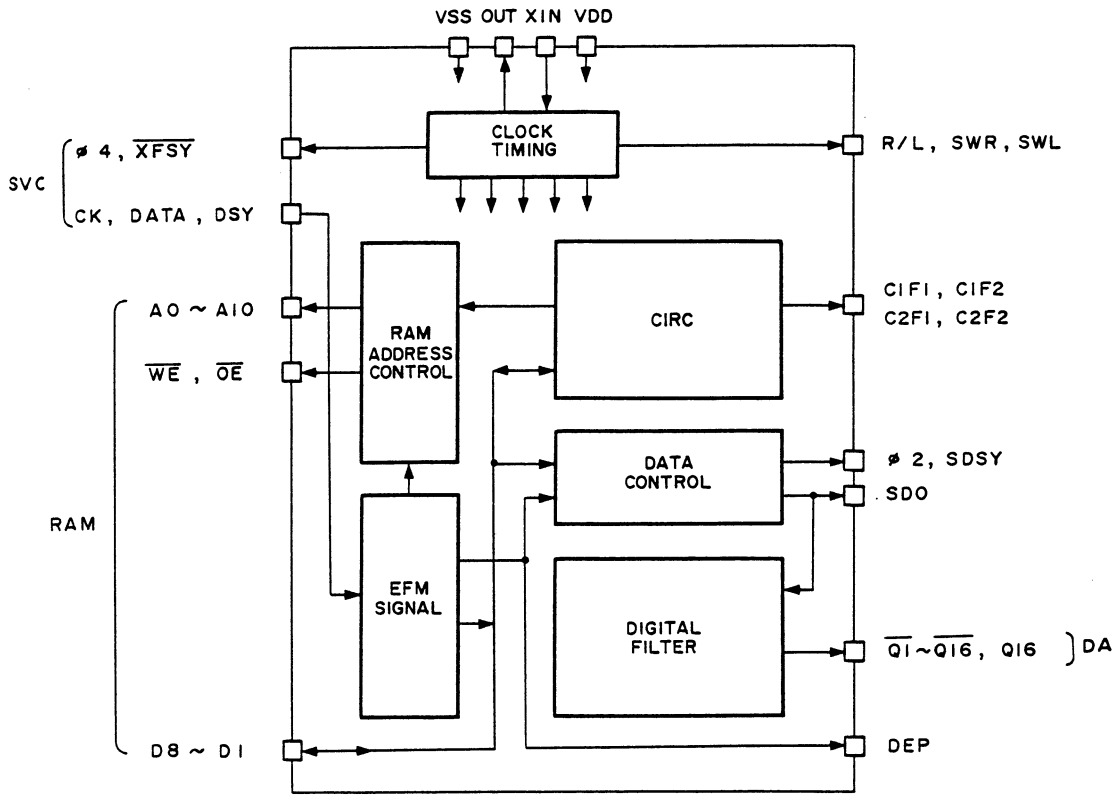
IC MOS YM3811
IC201



4. IC202 Terminal Functions

Terminal number	Terminal code	I/O	Outline of functions
1 17	VSS VSS	I I	These are the grounding terminals.
2 3 7 8	$\overline{\text{TEST 1}}$ $\overline{\text{TEST 2}}$ $\overline{\text{TEST 3}}$ $\overline{\text{TCL}}$	I + I + I + I +	These test terminals are ungrounded, and contain pull-up resistors.
4	CK	I	This is the VCO clock (average 4.3218MHz) input terminal, connected to the SVC output.
5	DATA	I	This is the serial signal input terminal for the 8 bit EFM demodulation signals and the 5 bit control signals, connected to the SVC output.
6	DSY	I	This is the synchronization signal input terminal for the serial signals (see above), connected to the SVC output.
9	$\phi 4$	0	This is the crystal clock (4.3218MHz) output terminal, connected to the SVC input.
10	$\overline{\text{XFSY}}$	I/0	This is the frame synchronization signals (7.35kHz) output terminal, connected to the SVC input. (During test operations, the synchronization can be resynchronized by setting this terminal to the "L level".)
11 12 13 14 15 16 18 19 20 21 24	A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10	0 0 0 0 0 0 0 0 0 0 0	These are the address output terminals, connected to the RAM address terminals.
22	$\overline{\text{WE}}$	0	This is connected to the RAM WE terminal. When a "L level" signal is registered, the RAM will be set to the WRITE mode.
23	$\overline{\text{OE}}$	0	This is connected to the RAM OE terminal. When a "L level" signal is registered, the RAM will be set to the READ mode.
25 26 27 28 29 30 31 32	D8 D7 D6 D5 D4 D3 D2 D1	I/0 I/0 I/0 I/0 I/0 I/0 I/0 I/0	These are connected to the RAM data terminals. The output mode is set when the cycle at the data input terminal is WE = "L", and the input mode is set when the cycle is WE = "H".
33	DEP	0	This is the output terminal for the audio frequency characteristics switching signals of the audio filter. The emphasis will be required when "H" is registered.

Terminal number	Terminal code	I/O	Outline of functions
34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50	$\overline{Q1}$ $\overline{Q2}$ $\overline{Q3}$ $\overline{Q4}$ $\overline{Q5}$ $\overline{Q6}$ $\overline{Q7}$ $\overline{Q8}$ $\overline{Q9}$ $\overline{Q10}$ $\overline{Q11}$ $\overline{Q12}$ $\overline{Q13}$ $\overline{Q14}$ $\overline{Q15}$ $\overline{Q16}$ Q16	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Connected to the DAC input, the parallel signals are output by way of the internal digital filter from these terminals. The output is in alternation from the left and right channels. The output rate for each channel is 88.2kHz. Connect either Q16 or ($\overline{Q16}$), according to the DAC to be used.
51	$\phi 2$	0	This is the crystal clock (2.1609MHz) output.
52	SDO	I/0	This is the serial signal output for the DAC. Using a $\phi 2$ clock beat rate, the signals are output from LSB in the order of L channel 24 bit – R channel 25 bit.
53	SDSY	0	This is the synchronization signal output for the above serial signals. The level is "H" for L channel and "L" for R channel.
56	TEST	I+	This test terminal contains pull-up resistors, and is normally disconnected. Using an "L" signal, it is also possible to input serial signals with the same format as the above serial signals from the SDO terminal into the digital filter.
54 55 57 58	C1F1 C1F2 C2F1 C2F2	0 0 0 0	This monitor output terminal depicts the C1 and C2 error correction operation mode.
59	R/L	0	This is the output terminal for the channel allocation signal of the DAC analog output. "H" is for the R channel, and "L" is for the L channel.
60 61	SWR SWL	0 0	This is the deglitch signal for the respective channels of the DAC analog output.
62	VDD	I	This is the +5V power supply terminal.
63 64	XIN XOUT	I 0	A crystal oscillator is connected between these terminals, which are used for the crystal clock (8.6436MHz) oscillation.

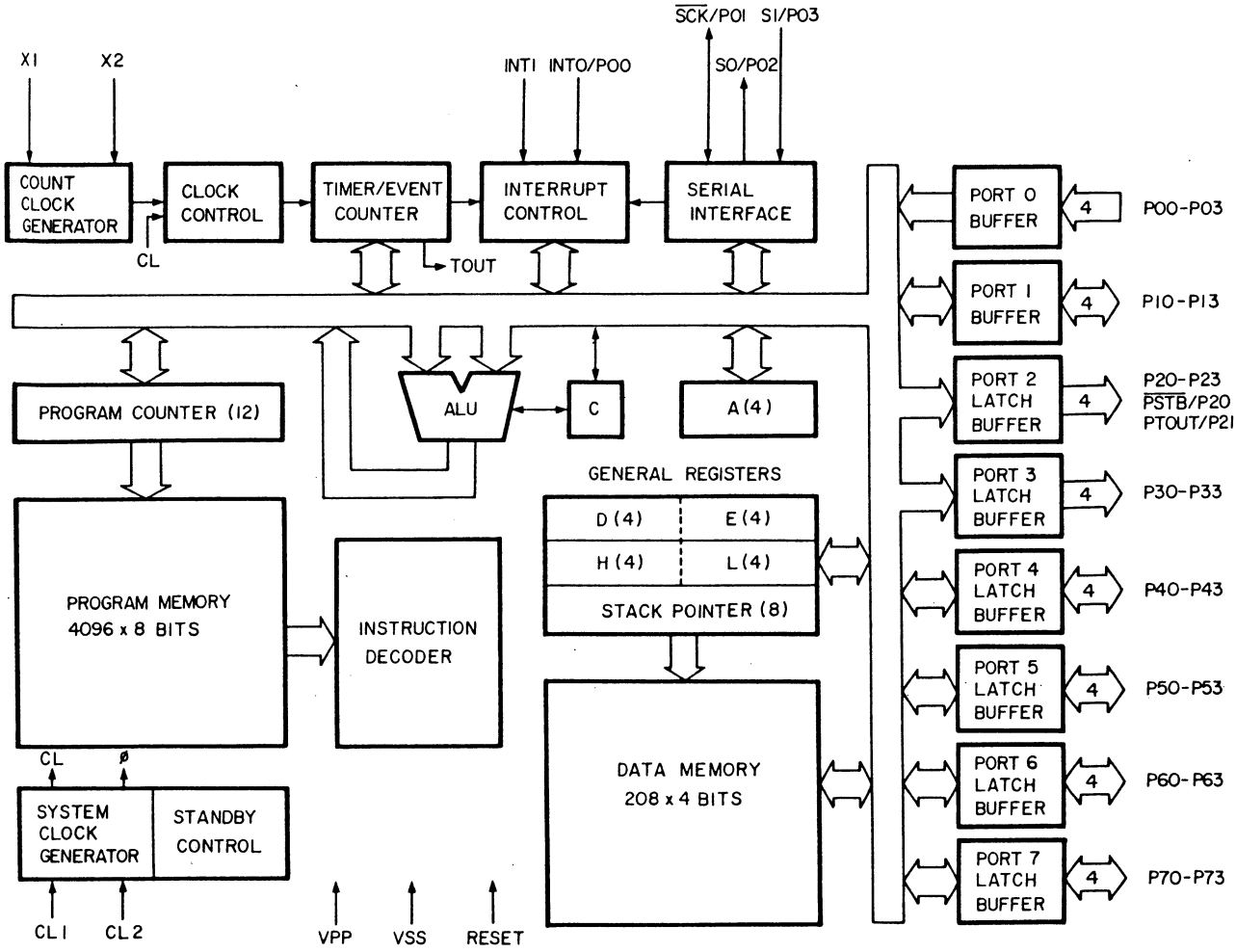


IC MOS YM-2601F

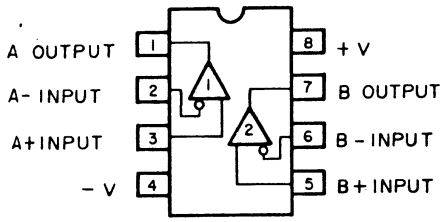
IC401 ICμPD7516HCW-256

PIN	Port Name	Cord	Function	I/O	Active Level	RESET
1	P20	ADD8	External RAM address	O	H	L
2	P21	WE	External RAM line signal	O	L	H
3	P22	R/W	3531 R/W	O	H	L
4	P23	D-OSG	Tray opening driving	O	H	L
5	RESET					
6	PPO	Non used				
7	NC					
8	P00	WQ	3531 read request	I	H	*
9	SCK	SCK	3531 serial clock	O	L	H
10	SO	DIN	3531 Data in	O	H	L
11	SI	D OUT	3531 Data out	I	H	*
12	P60	KI 4	Key input port	I	H	*
13	P61	IR	Remote control data	I	H	*
14	P62	LA-ON	Laser ON	O	H	L
15	P63	DISC	Disc detection	I	H	*
16	P50	DATA 0	External RAM address remote control data input	I/O	H	*
17	P51	DATA 1	External RAM address remote control data input	I/O	H	*
18	P52	DATA 2	External RAM address remote control data input	I/O	H	*
19	P53	DATA 3	External RAM address remote control data input	I/O	H	*
20	P10	KI 0	Key input port	I	H	*
21	P11	KI 1	Key input port	I	H	*
22	P12	KI 2	Key input port	I	H	*
23	P13	KI 3	Key input port	I	H	*
24	NC					
25	P40	ADD 0	External RAM address remote control data input	I/O	H	*
26	P41	ADD 1	External RAM address remote control data input	I/O	H	*
27	P42	ADD 2	External RAM address remote control data input	I/O	H	*
28	P43	ADD 3	External RAM address remote control data input	I/O	H	*
29	EVENT	Non used				
30	X2					
31	X1					
32	Vss					

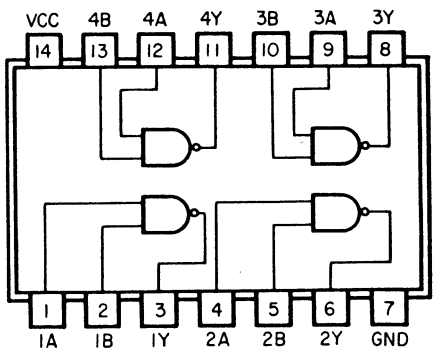
Pin	Port Name	Code	Function	I/O	Active Level	RESET
33	S7	Ph	Segment h	O	H	L
34	S6	Pg	Segment g	O	H	L
35	S5	Pf	Segment f	O	H	L
36	S4	Pe	Segment e	O	H	L
37	S3	Pd	Segment d	O	H	L
38	S2	Pc	Segment c	O	H	L
39	S1	Pb	Segment b	O	H	L
40	S0	Pa	Segment a	O	H	L
41	T15/S15	PAUSE LED	Pause LED static	O	H	L
42	T14/S14	PLAY LED	Play LED static	O	H	L
43	T13/S13	DISC LED	Disc LED static	O	H	L
44	T12/S12	STANDBY LED	Standby LED static	O	H	L
45	T11/S11	D-CSG	Tray closing driving	O	H	L
46	T10/S10	RECEIVE LED	Remote control code reception	O	H	L
47	T9/S9	T9	Index display 10	O	H	L
48	T8/S8	T8	Index display 1	O	H	L
49	T7	T7	Track display 10	O	H	L
50	T6	T6	Track display 1	O	H	L
51	T5	T5	Mode display A	O	H	L
52	T4	T4	Mode display A	O	H	L
53	T3	T3	Time display minute 10	O	H	L
54	T2	T2	Time display minute 1	O	H	L
55	T1	T1	Time display seconds 10	O	H	L
56	T0	T0	Time display seconds 1	O	H	L
57	V LOAD					
58	V PRE					
59	P30	ADD 4	External RAM address	O	H	*
60	P31	ADD 5	External RAM address	O	H	*
61	P32	ADD 6	External RAM address	O	H	*
62	P33	ADD 7	External RAM address	O	H	*
63	INT 1	OPEN/ CLOSE	OPEN/CLOSE key	I		*
64	VDD					



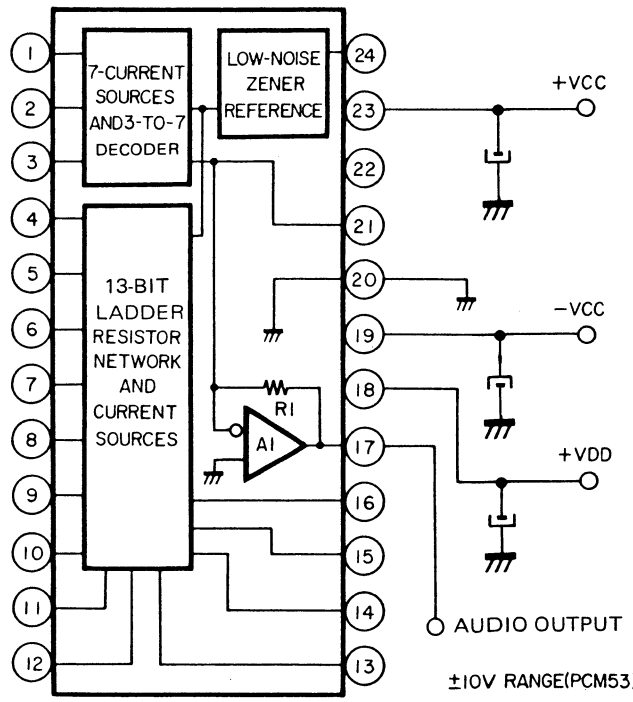
Micro-processor UPD7516CW-256



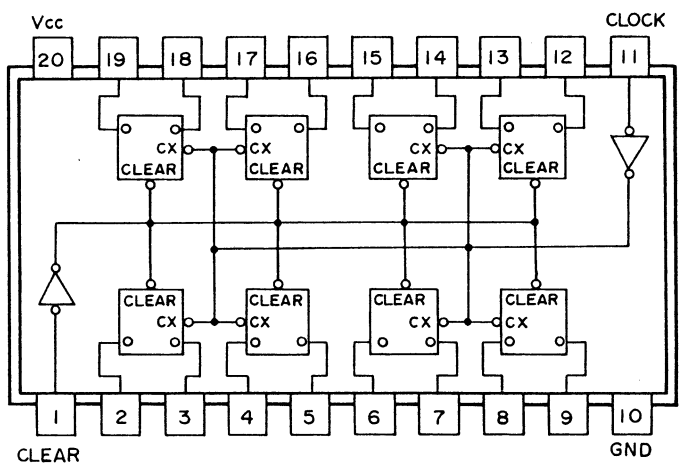
Operational Amp.
IC M5220L, NJM4560D,
BA4558
M5218L



NAND GATE MOS IC SN74HCOON

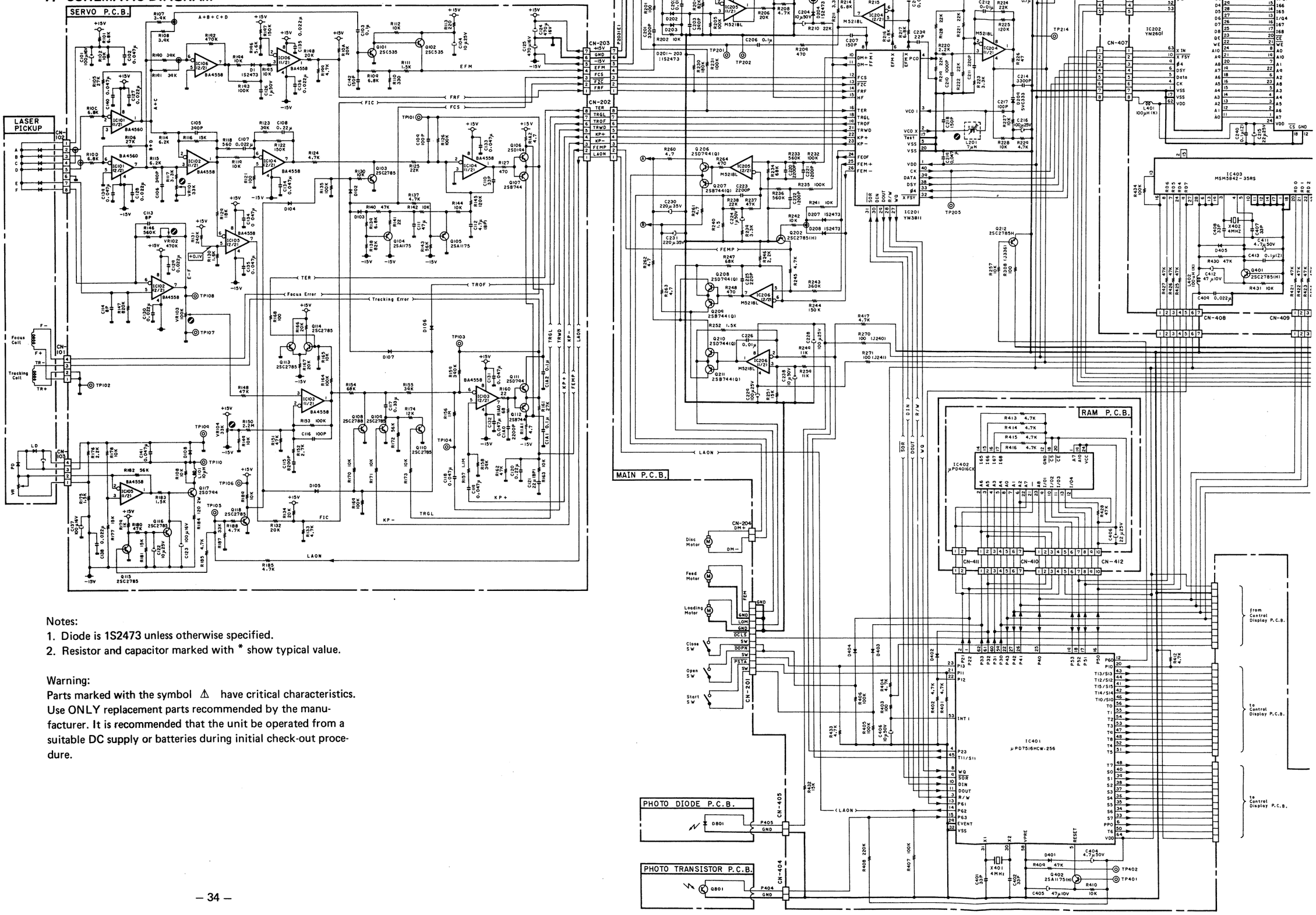


IC PCM54JP



74HC273

7. SCHEMATIC DIAGRAM



Notes:

1. Diode is 1S2473 unless otherwise specified.
2. Resistor and capacitor marked with * show typical value.

Warning:

Parts marked with the symbol ⚠ have critical characteristics. Use ONLY replacement parts recommended by the manufacturer. It is recommended that the unit be operated from a suitable DC supply or batteries during initial check-out procedure.

SIGNAL PROCESS P.C.B.

D F/F P.C.B.

DAC P.C.B.

ANALOG FILTER P.C.B.

RAM P.C.B.

IC202 YM2601

IC203 μPD4016GX

IC204 M52181

IC306 TC74HC273P

IC305 TC74HC273P

IC309 PCM54JP

IC308 PCM54JP

IC307 74HC04

IC304 74HC04

IC303 74HC74

IC301 μPD-6352CA

IC302 NEC HE AV-01

IC401 μPD7516HCW-256

IC402 μPD4016GX

IC403 MSM5842-35RS

IC201 YM3811

IC310 (1/2)

IC311 (1/2)

IC312 μPC1237H

IC501 μPC7805H

CN-406

CN-407

CN-408

CN-409

CN-310

CN-311 (2/2)

CN-311 (1/2)

CN-312

CN-411

CN-410

CN-412

Q306,308,314,316 : 2SC945(Q)
Q310,312,318,320 : 2SA733

Q309,311,317,319 : 2SA733(Q)
Q305,307,313,315 : 2SC945(Q)

Q321,323 : 2SC2240
Q325,326 : 2SC2320(F)
Q327 : 2SA967

Q301 2SC2901L

Q303 2SA1206L

Q401 2SC2785(H)

Q212 2SC2785H

Q501 2SD794(Q)

Q502 2SB744(Q)

Q503 2SD794(Q)

Q504 2SB744(Q)

Q341 2SD667

Q342 2SD667

Q343 2SAM75

D502 S1VB10

D501 RB-151

D503 1SR35

D504 1SR35

D506 RD16EB1

D507 RD16EB1

D508 RD16EB1

D509 RD16EB1

D510 RD16EB1

D511 RD16EB1

D512 RD16EB1

T1

TF

SW1

P501

FU501 250V 630mA

TERMINAL P.C.B.

120V (CSA) 4A
40 (100V : 50/60 Hz)
5MK (220V : 50/60 Hz)

AC 110/120 220/240

VAC

+15V

+5V

VCO I

VCO X

VSS

VDD

CK

DATA

DSY

φ4

X FSY

SOR

DIN

DOUT

R/W

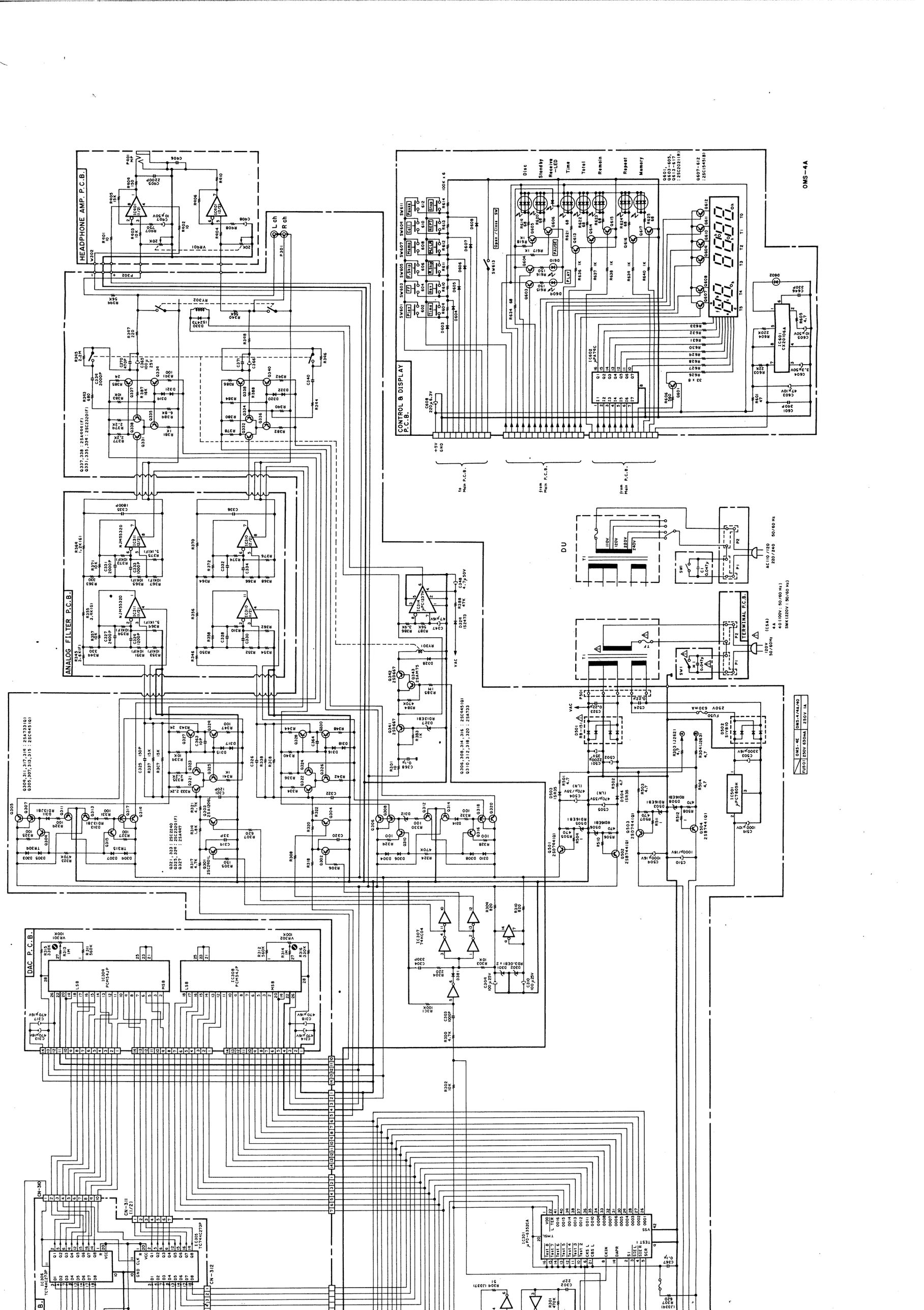
VQ

from Control Display P.C.B.

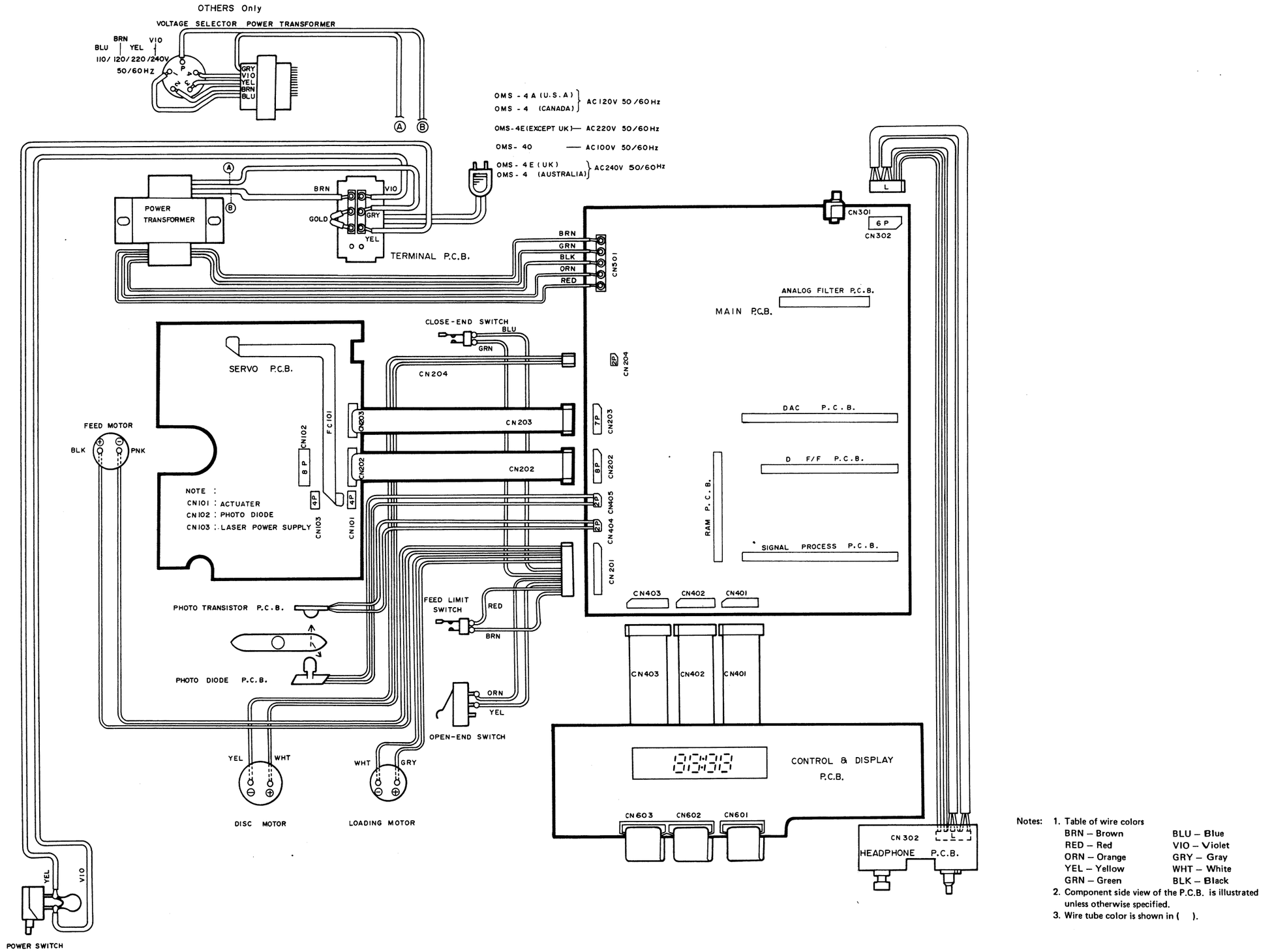
to Control Display P.C.B.

to Control Display P.C.B.

DU


HEADPHONE AMP. P.C.B.
ANALOG FILTER P.C.B.
DAC P.C.B.
CONTROL & DISPLAY P.C.B.
TERMINAL P.C.B.
DU
L ch
R ch
OMS-4A
Disc
Standby Receive -LED
Time
Total
Remain
Repeat
Memory
to Main P.C.B.
from Main P.C.B.
from Main P.C.B.
AC110 /120 220/240 50/60 Hz
120V 50/60Hz (CSA) 4A
40 (100V : 50/60 Hz) SMK(220V : 50/60 Hz)
250V 1A
250V 630mA

8. WIRING DIAGRAM

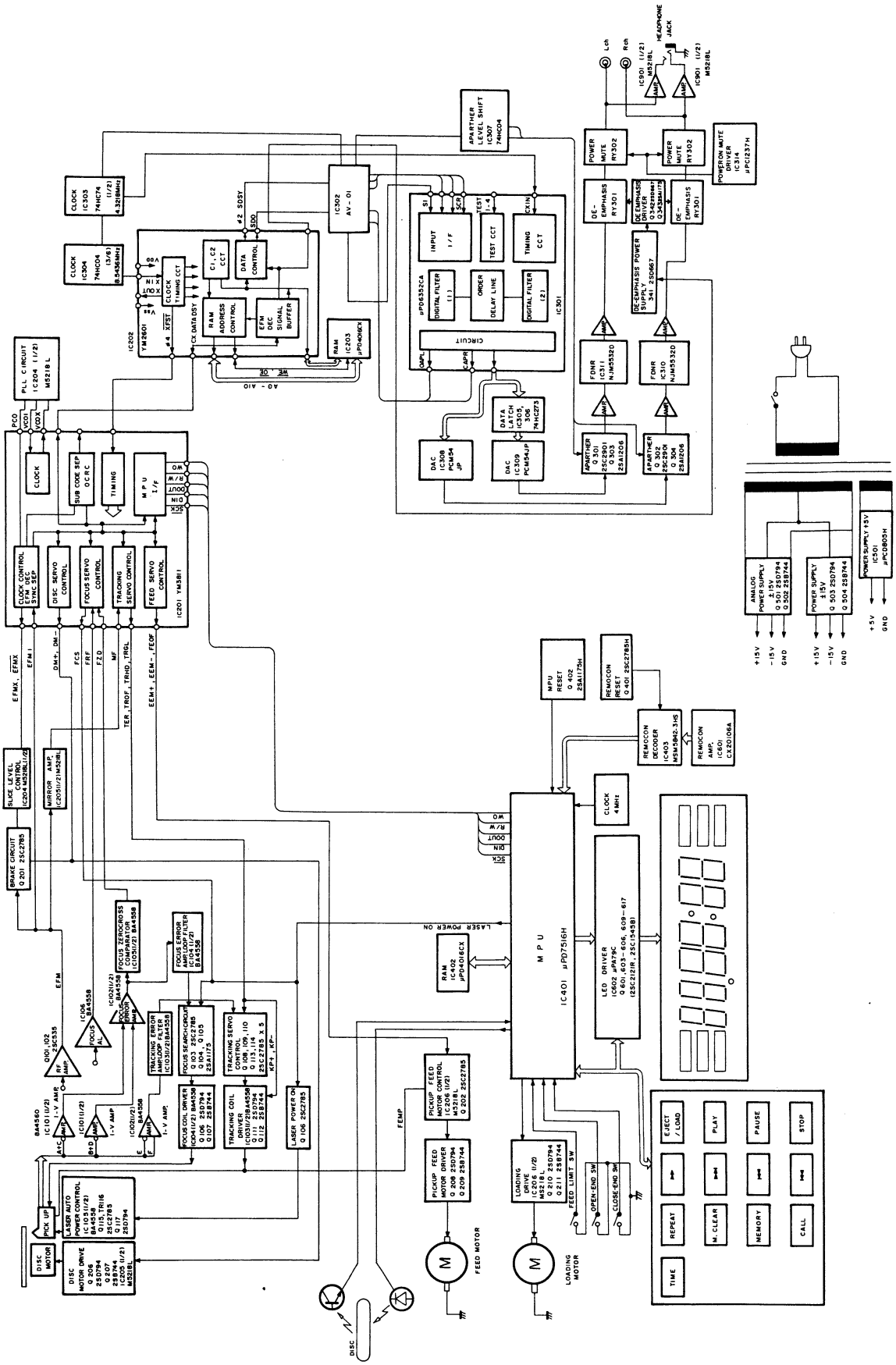


Notes: 1. Table of wire colors

BRN – Brown	BLU – Blue
RED – Red	VIO – Violet
ORN – Orange	GRY – Gray
YEL – Yellow	WHT – White
GRN – Green	BLK – Black

2. Component side view of the P.C.B. is illustrated unless otherwise specified.
3. Wire tube color is shown in ( ).

9. BLOCK DIAGRAM



10. SPECIFICATIONS

■ **Main Unit**

System . . . . . Compact Disc digital audio
Signal Readout . . . . . Optical (semiconductor laser)
Error Correction . . . . . CIRC principle
Number of Channels . . . . . 2 channels, stereo
Sampling Frequency . . . . . 44.1 kHz
Quantization . . . . . 16 bit linear
Disc Rotational Velocity . . . . . Approx 200 to 500 rpm
(constant linear velocity)
Wow-and-Flutter . . . . . Below measurement limit
Frequency Response . . . . . 5 – 20,000 Hz ±0.5 dB
Signal-to-Noise Ratio . . . . . Better than 100dB
(IHF A-WTD)
Dynamic Range . . . . . Better than 93 dB
Total Harmonic Distortion 0.004%
(1kHz)
Total Harmonic Distortion + Noise (1 kHz) 0.0055%
Channel Separation . . . . . Better than 94 dB
Output (Line 1kHz 0dB) 2.5V/220Ω
(Headphone 1kHz, 0dB) . . . Approx. 35mW into 40Ω
Power Requirements . . . . . 120, 220, 240 or
110-120/220 – 240V
AC, 50/60 Hz
(According to country of sale)
Power Consumption . . . . . 40 W max.
Dimensions . . . . . 430 (W) x 100 (H) x 322 (D) mm
16-15/16 (W) x 3-15/16 (H) x 12-11/16 (D) inches
Approximate Weight . . . . . 7.1 kg, 15 lbs., 10 oz.

■ **Remote Control Unit (RM-4CD)**

Principle . . . . . Infrared Pulse system
Power Supply . . . . . 3V DC (1.5 V x 2)
Dimensions . . . . . 50 (W) x 19 (H) x 162 (D) mm
2 (W) x 3/4 (H) x 6-3/8 (D) inches
Approximate Weight . 100 g, 3-1/2 oz (including batteries)

- Specifications and design are subject to change for further improvement without notice.